(30,166)

SUPREME COURT OF THE UNITED STATES

OCTOBER TERM, 1924

No. 307

CONCRETE APPLIANCES COMPANY AND WILLIAM H. INSLEY, PETITIONERS,

vs.

JOHN E. GOMERY, JOHN C. SCHWARTZ, MICHAEL J. O'MEARA, ET AL.

ON A WRIT OF CERTIORARI TO THE UNITED STATES CIRCUIT COURT OF APPEALS FOR THE THIRD CIRCUIT

INDEX

	Original	Print
Record from the district court of the United States, eastern district of Pennsylvania	1	1
Docket entries	1	1
Bill of complaint	10	5
Answer	16	9
Stipulation for amendment to answer	23	13
Amendment to answer	24	13
Defendants' interrogatories to plaintiffs	30	17
Plaintiffs' answer to interrogatories	31	18
Defendants' additional interrogatories to plaintiffs	32	18
Plaintiffs' answer to additional interrogatories	33	19
Testimony of Charles Cooper	36	20
William T. Baker	45	25
Walter Newsom Thornton	56	31
Roland Brinkley	67	37

JUDD & DETWEILER (INC.), PRINTERS, WASHINGTON, D. C., DECEMBER 4, 1924

	Original	Print
Testimony of F. M. Glines	69	39
Carter Gay	78	43
Andrew J. Kerns	83	46
J. Samuel Goldback	103	58
Lee Callahan	119	67
Edward Anderson	186	104
Hooper O. Anderson	191	107
Stipulation re testimony of W. B. Ittner, P. J. Curran, and R. M. Milligan	196	109
Testimony of Edgar H. Thompson	200	112
W. H. Insley	211	118
Fount M. Woodward	1	131
Andrew W. Woodman	12	138
Leopold J. Mensch	23	144
William R. Sinks	45	157
Henry O. Webb	80	178
William T. McCann	94	188
Alexander Cameron	109	196
Arthur L. Smith	141	216
Robert B. Preston	177	238
Townsend A. Tatterson	195	249
Albert E. Culp	229	270
Stipulation re testimony of Charles H. Longley	235	273
Stipulation re testimony of George Botsung	247	281
Testimony of Jerome C. Alderman	247	281
Stipulation re testimony of A. L. Newman	277	299
Testimony of Stephan Creutz, Jr	278	300
Testimony of Alexander C. Patterson	309	319
Stipulation re testimony of E. L. Moe	312	321
Testimony of Carl T. Anderson	313	321
George W. Herthel	329	331
Edward C. Gerhard	335	335
Samuel C. Black	356	348
F. C. Bonsack	370	357
Herman A. Bankes	374	359
James L. Hopkins	388	369
John W. Goebel	394	372
Stipulation re testimony of D. G. Scott	415	385
Stipulation re testimony of Eugene Taylor	415	385
Testimony of Wilbur B. Jones	416	386
Lewis A. Stinson	417	387
Howard C. Blake	444	403
Harold D. Squires	461	413
Hugh W. Bryson	479	425
L. A. Parker	518	448
Arthur H. Bannister	537	460
Stipulation re testimony of Walter Cahill	554	470
Testimony of Edward J. Fuick	555	471
Russell H. Folwell	567	478
Robert H. Hughes	580	486

	Original	Print
Testimony of William G. Fargo	593	494
Stipulation re testimony of Horace S. Hunt	602	500
Testimony of Theodore Emtman	604	501
Kurt O. Wetzel	624	514
Luther M. Hill	630	518
Swan P. Johnson	641	524
Charles C. Horton	645	527
Martin E. Brown	657	534
Fred L. Ayer	680	548
Stipulation re testimony of Edward C. Gerhard	693	556
Stipulation re exhibits	693	556
Notice to take testimony	1	558
Testimony of Charles W. Ellis	2	559
John R. Williams	20	570
Fred Bruner	28	575
Frank I. Ginsberg	41	582
Frederick E. Engstrum	49	588
W. H. Insley	60	594
H. M. Kebby	65	597
Robert Tibbitts	81	607
Charles C. Horton	92	613
Fred L. Ayer	110	624
Notarial certificate	125	634
Plaintiffs' Exhibit N—Drawings of patent in suit and specification of letters patent	127	635
Defendants' Exhibit 36—Amendment to preliminary statement of Arthur L. Smith and certificate thereto	139	635
Defendants' Exhibit 38—Drawing of gallery along new wharf	145	638
Defendants' Exhibit 39—Drawing of outer end of wharf galleries and end dock spouts	147	638
Defendants' Exhibit 63—Preliminary statement of Arthur L. Smith and certificate thereto	149	638
Preliminary statement of Lee Callahan	153	641
Preliminary statement of Theodore Emtman	154	642
Preliminary statement of Lee Callahan	158	644
Defendants' Exhibit 67—Drawings of A. L. Smith patent, device for distributing concrete, and specification of letters patent	161	645
Defendants' Exhibit 68—Letters patent of Theodore Emtman and certificate thereto	169	645
Opinion, Dickinson, J., sur trial hearing on bill	177	645
Opinion, Dickinson, J., sur reargument	186	650
Supplemental finding, Dickinson, J	188	652
Decree	190	653
Bill of costs (omitted in printing)	191	654
Exceptions to taxation of bill of costs	197	657
Opinion, Dickinson, J., sur exceptions to taxation of bill of costs	198	657
Order on exceptions to taxation of bill of costs	200	658

	Original	Print
Stipulation re payment of costs	201	659
Petition for and order allowing appeal	203	660
Assignment of errors	204	661
Præcipe for transcript of record	205	661
Clerk's certificate	207	662
Defendants' Exhibit 66—U. S. patent No. 69,375 to Voorhis.	212	666
U. S. Patent No. 243,327 to Toepfer.	216	668
U. S. patent No. 366,468 to Edwards & Kelly	220	670
U. S. patent No. 371,343 to McLennan	228	675
U. S. patent No. 426,301 to Musgrove & Clarke	238	681
U. S. patent No. 445,645 to Simpson	244	684
U. S. patent No. 464,101 to Mayo	250	688
U. S. patent No. 524,984 to Robinson	258	693
U. S. patent No. 556,371 to Rasch	264	697
U. S. patent No. 560,382 to Walsh	278	705
U. S. patent No. 582,598 to Bird	282	707
U. S. patent No. 605,375 to Bellinger	286	710
U. S. patent No. 622,019 to Robinson	292	714
U. S. patent No. 667,335 to Record.	302	720
U. S. patent No. 681,378 to Shoemaker & Willson	310	725
U. S. patent No. 694,579 to Ransome	328	735
U. S. patent No. 702,372 to Montgomery	332	737
U. S. patent No. 714,150 to Clarke.	338	742
U. S. patent No. 718,092 to Clarke.	426	798
U. S. patent No. 721,215 to Metzger	436	804
U. S. patent No. 753,616 to Nicholson	440	807
U. S. patent No. 760,015 to Parker.	446	811
U. S. patent No. 769,126 to Adams.	454	816
U. S. patent No. 830,385 to Wallace.	462	821
U. S. patent No. 862,874 to Beach	470	826
U. S. patent No. 866,166 to Theiss, Whann & Englisbee	480	832
U. S. patent No. 875,529 to Joehnck	492	840
U. S. patent No. 939,072 to Ney	502	846
U. S. patent No. 948,723 to Emtman	506	849
U. S. patent No. 969,172 to Lonney.	510	852
British patent No. 1124 of 1864 to Potter	541	872

	Original	Print
Defendants' Exhibit 66—British patent No. 3107 of 1872 to Ellington & Anderson	555	885
British patent No. 2017 of 1880 to Johnson	563	892
British patent No. 10,380 of 1888 to Ballie	573	899
British patent No. 16,525 of 1895 to Roe	583	906
British patent No. 19,554 of 1903 to Holland	605	923
British patent No. 7307 of 1908 to Gibb	609	925
Proceedings in United States circuit court of appeals for third circuit	621	933
Opinion, Buffington, J	621	933
Decree	634	940
Order modifying decree	634	940
Clerk's certificate	636	941
Order granting petition for certiorari	637	942

[fol. 1] **IN UNITED STATES DISTRICT COURT FOR THE EASTERN DISTRICT OF PENNSYLVANIA, JUNE TERM, 1920**

No. 2067

CONCRETE APPLIANCES COMPANY and WILLIAM H. INSLEY

v.

JOHN E. GOMERY, JOHN C. SCHWARTZ, MICHAEL J. O'MEARA, and CONCRETE CONSTRUCTION COMPANY

Hood & Schley, Cyrus N. Anderson.
Sheridan, Jones & Smith, Wm. Steell Jackson.

DOCKET ENTRIES

July 19, 1920. Bill of Complaint filed.
" " " Supbœna exit—returnable August 9, 1920.
" 20, " Appearance of Sheridan, Jones, Sheridan & Smith and William Steell Jackson for defendant filed.
" 26, " Motion for Preliminary Injunction filed.
" " " Affidavit of Henry I. Peirce in support of motion for Preliminary Injunction filed.
" " " Affidavit of Wm. H. Insley in support of motion for Preliminary Injunction filed.
[fol. 2] Order of Court fixing August 2, 1920, as time for filing Deft's Affidavits; August 5, 1920 for plaintiff's rebuttal affidavits; and August 6, 1920, for hearing on motion for preliminary injunction filed.
July 29, 1920. Justification of Surety filed.
" " " Bond for Costs in $250. with Fidelity and Casualty Company of New York Surety filed.
" " " Order of Court approving Bond for Costs filed.
" 31, " Printed copy of Bill of Complaint filed.
Aug. 3, 1920. Stipulation of counsel extending time in which to file affidavits filed.
" 3, " Order of Court approving Stipulation of counsel filed.
" 6, " Subpœna returned; July 22, 1920 served as to each defendant and filed.
" 9, " Certified copy page 97—July 30, 1903 issue of Engineering News filed.
" " " Certified copy of Arthur L. Smith—Preliminary statement in Patent Office Interference 30533 filed.
" " " Certified copy of preliminary statement of Lee Callahan—Patent Office Interference 30533 filed.

Aug. 9, 1920. Copy of Preliminary Statement of Theodore Emtman—Patent Office Interference 30533 filed.
" " " Affidavit of Arthur L. Smith filed.
" " " Affidavit of George Botzung filed.
" " " Affidavit of Albert E. Culp filed.
" " " Affidavit of John S. Bronson filed.
" " " Affidavit of George B. Jones filed.
" " " Affidavit of Herman A. Bankus filed.

[fol. 3]

Aug. 9, 1920, Affidavit of Edward C. Gerhard filed.
" " " Affidavit of Clarence E. Miller filed.
" " " Affidavit of Eugene Taylor filed.
" " " Affidavit of Edwin M. Prettyman filed.
" " " Affidavit of John C. Schwartz filed.
" " " Certified copy of record on appeal, Briefs for Appellants and appellees in case of Concrete Appliances Co. et al. vs. Meinken from Court of Appeals Sixth Circuit filed.
" " " Copy of Preliminary Statement of Theodore Emtman Patent Office Interference 30618 filed.
" " " Copy of Preliminary Statement of Lee Callahan, Patent Office Interference 30618 filed.
" 10, " Affidavit of Louis C. Masten in opposition to Motion for Preliminary Injunction filed.
" 10, " Affidavit of George B. Jones in opposition to Motion for Preliminary Injunction filed.
" 11, " Affidavit of W. L. Winimer in opposition to Motion for Preliminary Injunction filed.
" 11, " Affidavit of John Walter Goebel in opposition to Motion for Preliminary Injunction filed.
" 25, " Stipulation to extend time for filing answer filed.
" " " Order of court extending time for filing answer to August 30, 1920 filed.

Sept. 20, 1920. Answer filed.
" 25, " Stipulation of counsel for amendment to answer filed.

[fol. 4]

Sept. 25, 1920. Defendants Interrogatories filed.
" 25, " Acceptance of Service of copy of defendant's Interrogatories filed.

Oct. 9, 1920. Printed copy of Answer filed.
" 11, " Answers to defendants' Interrogatories filed.
" 15, " Defendants' Interrogatories filed.
" " " Acknowledgment of Service of Copy of Interrogatories filed.

Nov. 8, 1920. Rebuttal Affidavit of Henry T. Peirce filed.
" " " Rebuttal Affidavit of William T. Baker filed.
" " " Rebuttal Affidavit of J. Samuel Goldback filed.
" " " Rebuttal Affidavit of William H. Insley filed.
" " " Rebuttal affidavit of Roland Bunkley filed.
" " " Rebuttal affidavit of Andrew J. Kearns filed.

Nov. 8, 1920. Additional affidavit of Andrew J. Kearns filed.
" " " Rebuttal Affidavit of Walter Newson Thornton filed.
" 12, " Rebuttal Affidavit of H. W. Bryson and Lee Callahan filed.
" " " Affidavit of Service by F. S. Lyon filed.
" 13, " Rebuttal Affidavit of Edward L. Mayberry filed.
" " " Affidavit as to Service filed.
" " " Notice of hearing of Motion for unqualified answer
[fol. 5] to defendant's Interrogatary filed.

Nov. 8, 1920. Acknowledgment of service of Notice filed.
" " " Motion for unqualified answer to defendants' Interrogatory filed.
" " " Second affidavit of Edwin M. Prettyman filed.
" 15, " Argued sur Motion for Preliminary Injunction.
" 24, " Stipulation of counsel extending time in which to file bond filed.
Dec. 1, 1920. Decree that upon filing proper bond, Motion for Preliminary Injunction be dismissed, filed.
" " " Bond in $10,000 with American Surety Company of New York, surety filed.
" " " Order of Court approving Bond filed.
" 23, " Defendants' additional Interrogatories filed.
" 23, " Decree that additional Interrogatories be answered within ten days, filed.
Jan. 8, 1921. Plaintiffs' answer to Interrogatory No. 1 filed.
May 18, 1921. Argued sur defendants' Motion to take additional testimony.
" 18, " Decree granting leave to defendants to take depositions de bene esse filed.
" " " Deposition of George Bayard Jones filed.
Oct. 3, 1921. Deposition of Lewis A. Stinson on behalf of defendants filed.
" " " Deposition of A. E. Culp on behalf of defendants
[fol. 6] filed.

Oct. 3, 1921. Affidavit of J. C. Black on behalf of defendants filed.
" " " Deposition of J. W. Goebel on behalf of defendants filed.
" " " Deposition of H. A. Bankes on behalf of defendants filed.
" " " Deposition of G. W. Herthel on behalf of defendants filed.
" " " Deposition of J. L. Hopkins on behalf of defendants filed.
" " " Deposition of F. C. Bonsack on behalf of defendants filed.
" " " Deposition of W. B. Jones on behalf of defendants filed.
" " " Deposition of Wm. G. Fargo on behalf of defendants filed.

Oct. 3. 1921. Deposition of Albert L. Smith on behalf of defendants filed.
" " " Deposition of Charles C. Horton on behalf of defendants filed.
" " " Depositions on behalf of W. E. Brown on behalf of defendants filed.
" " " Deposition of Fred Layer filed.
" " " Deposition of A. H. Bannister on behalf of defendants filed.
" " " Deposition of H. W. Bryson on behalf of defendants filed.
" " " Deposition of E. C. Gerhard on behalf of defendants filed.
" " " Deposition of J. C. Alderman on behalf of defendants filed.
" " " Deposition of Alexander Cameron on behalf of defendants filed.
" " " Depositions of F. M. Woodward, L. L. Mensels, and Wm. T. McCann on behalf of defendants filed.

[fol. 7]

Oct. 3, 1921. Depositions of R. B. Preston, and T. A. Tatterson on behalf of defendants filed.
" " " Depositions of T. Emtman on behalf of defendants filed.
" " " Final Hearing and Witnesses sworn.
" 4, " Stipulation of Counsel as to testimony of E. C. Gerhard filed.
" " " Stipulation of Counsel as to Exhibits 52 and 64 filed.
" " " Stipulation of Counsel as to copies of Patents filed.
" " " Hearing resumed (Witnesses sworn).
" 5, " Printed copy of defendants' depositions filed.
Nov. 28, 1921. Notice of Defendants' Motion for surrebuttal testimony filed.
" " " Defendants' Motion for sur-rebuttal testimony filed.
" " " Argued sur Motion to take sur-rebuttal evidence.
" " " Decree continuing Defendants' Motion to take surrebuttal testimony filed.
Dec. 2, 1921. Deposition of Charles W. Ellis on behalf of defendants filed.
" 30, " Decree granting leave to take certain testimony filed.
Feb. 9, 1922. Depositions of H. M. Kirby and Robert Tibitts on behalf of plaintiff filed.
" " " Depositions of Charles C. Horton and Fred L. Ayer on behalf of defendant filed.
" 22, " Plaintiffs Exhibits O. P. & I. filed.
Apr. 15, 1922. Plaintiffs' withdrawal of objections to defendants' Exhibit 64 filed.

[fol. 8]

Apr. 17, 1922. Defendants' Exhibit 2 (photograph A-B Canadian Suit) filed.

Apr. 17, 1922. Defendants' Exhibit 21 (Ransome Concrete Machinery Co. 1906 catalogue) filed.
June 13, 1922. Opinion—Dickinson, J. dismissing Bill of Complaint with costs to defendant filed.
" 23, " Testimony filed.
Oct. 23, 1922. Request for re-hearing filed.
" 31, " Opinion Dickinson J. filed.
Nov. 6, 1922. Supplemental Finding Dickinson J. filed.
" 15, " Stipulation of Counsel releasing defendants from obligation under bond filed December 1, 1920 filed.
" 20, " Decree dismissing Bill of Complaint at cost of plaintiff filed.
Dec. 26, 1922. Defendants' Bill of Costs filed.
" 26, " Bill of Costs taxed at $2,329.59.
" 28, " Exceptions to taxation of defendants' Bill of Costs filed.
Jan. 17, 1923. Argued sur exceptions to defendants' Bill of Costs filed.
" 19, " Opinion Dickinson J. reducing defendants' Bill of Costs to $2,119.16 filed.
" 22, " Decree in re exceptions to defendants' Bill of Costs and taxing Bill of Costs in $2,119.16 filed.
" 30, " Assignments of Error filed.
" " " Petition for Appeal filed.
" " " Order of Court granting prayer of Petition filed.
" " " Stipulation of counsel as to payment of costs filed.

[fol. 9]

Jan. 30, 1922. Præcipe for transcript of record sur appeal filed.
" " " Stipulation of Counsel as to certain exhibits to be incorporated in record sur appeal filed.
Feb. 1, 1923. Copy of notice of appeal filed.
" 8, " Defendants' Exhibit 19 filed.
" 13, " Bond sur appeal in $2,500 with Maryland Casualty Company surety—filed.
" 13, " Decree approving Bond sur Appeal filed.
" 13, " Citation allowed and issued.
" 19, " Citation returned—service accepted and filed.

[fol.10] IN UNITED STATES DISTRICT COURT

[Title omitted]

BILL OF COMPLAINT—Filed July 19, 1920

To the Honorable the judges of the District Court of the United States in and for the Eastern District of Pennsylvania:

Concrete Appliances Company, a corporation duly organized under and in accordance with the laws of the State of California, and

having its principal office and place of business in the City of Los Angeles, State of California, and a citizen of said State, and William H. Insley, a citizen of the State of Indiana, and a resident of Indianapolis, Indiana, bring this, their bill, against John E. Gomery, a citizen of the State of Pennsylvania, and located in Philadelphia, Pennsylvania, at 128 North Broad Street; and John C. Schwartz, a citizen of the State of Pennsylvania, and located in Philadelphia, [fol. 11] Pennsylvania, at 128 North Broad Street; and Michael J. O'Meara, a citizen of the State of Pennsylvania, and resident in the City of Philadelphia, Pennsylvania, and located at 329 South Broad Street; and Concrete Construction Company, a corporation organized under the laws of the State of Delaware, and having a regular and established place of business at 1718 Thompson Street, Philadelphia, Pennsylvania; and thereupon your orators complain and say:

1. That this is a suit arising out of, and under the statutes of the United States relating to patents, more especially Sections 4919, 4920 and 4921.

2. Plaintiff Concrete Appliances Company is the sole owner of Letters Patent No. 948,719, which were issued to Concrete Appliances Company, a corporation of Missouri, upon the application of Lee Callahan, for Material Transferring Apparatus, said letters patent having been issued by the Commissioner of Patents on February 8, 1910, pursuant to statutory application therefor, filed January 21, 1909, by the aforesaid Lee Callahan, the original and sole inventor of the subject matter thereof. A copy of said patent is attached hereto, in lieu of the original, which plaintiffs are ready to produce in court.

3. Plaintiff William H. Insley is the owner by reason of an instrument in writing, dated September 13, 1915, and executed by plaintiff Concrete Appliances Company, of the exclusive right and privilege under the aforesaid Letters Patent No. 948,719 to manufacture, use and sell to others to use, apparatus and devices embodying the invention covered by the aforesaid letters patent, except as the right to use, or to manufacture and sell to others to use, has heretofore been granted by the joint action of this plaintiff and his co-plaintiff Concrete Appliances Company.

[fol. 12] 4. The subject matter of said letters patent is of great utility and has been extensively employed in this country by and under the authority of plaintiffs and their predecessors; plaintiffs' rights under said patent are of great value and have been generally recognized and acquiesced in by the public, an exception being the infringing acts of these defendants, hereinafter set forth more in detail; said acts of defendants encouraging others to violate the rights thus secured to plaintiffs, the plaintiffs are suffering, and have suffered, great and irreparable damage, by reason of the unlawful acts of these defendants.

5. The plaintiffs and their predecessors have given adequate notice to the defendants of the existence and ownership of said letters patent and defendants' infringement thereof; and have marked, or caused to be marked, machines manufactured and sold by, or under plaintiffs' authority, in accordance with the provisions of the statutes of the United States relating thereto. Nevertheless, the said defendants have conjointly, and in conspiracy with each other, infringed upon the aforesaid letters patent, and plaintiffs' rights hereunder, within this district and after the issuances of said patent, and threaten to further infringe said patent, and at the present time are infringing said patent, said past, present and threatened infringement having been accomplished and threatened within this district and elsewhere, according to plaintiffs' information and belief, as follows:

Defendants John E. Gomery and John C. Schwartz prior to the filing of this bill of complaint, purchased from parties having no right or license under the aforesaid patent, and believed by plaintiffs herein to have been the Sackett Screen & Chute Company, of Chicago, Illinois, an apparatus for handling fresh concrete in building [fol. 13] operations, said apparatus comprising a tower, a hoisting bucket mounted and vertically movable in said tower, a hopper supported upon said tower and vertically shiftable from place to place thereon, a horizontally swinging boom pivotally mounted upon the tower and vertically shiftable thereon from place to place in cooperative relationship with the hopper, and a chute section carried by the boom and arranged and provided with means to receive concrete from the hopper and to deliver the same by gravity through the chute, and have erected, or caused to be erected, the said apparatus on the west side of Twenty-fourth Street, between Market and Chestnut Streets, in the City of Philadelphia, Pennsylvania, for the purpose of utilizing the same in the fabrication of a reinforced concrete building at that point; the defendant Michael J. O'Meara is a contractor, engaged, in association with the said defendants Gomery and Schwartz, in the fabrication of the proposed building as aforesaid. The defendant Concrete Construction Company is engaged, as a subcontractor, or otherwise, under or in association with, the defendant Michael J. O'Meara, in the direct use of the aforesaid apparatus, in the fabrication of the building.

Plaintiffs, therefore, alleged that the several defendants herein conspired together and in association with each other, and with the aforesaid fabricator of the apparatus believed to be Sackett Screen and Chute Company, in the manufacture, sale and use of the aforesaid apparatus, in infringement of the rights of plaintiffs, and for the purpose and with the intent of further infringement thereof; and that the said defendants are now using and continuing to use, said apparatus in infringement of the rights of plaintiffs, all within the Eastern District of Pennsylvania, as aforesaid.

[fol. 14] 6. Plaintiffs further allege that the aforesaid Patent No. 948,719, especially as to its claims 1, 2, 5 and 13, has been found valid by the United States Circuit Court of Appeals of the Sixth Circuit, and said claims were held infringed by a structure substantially

identical, in all material respects, with the structure herein complained of in the case of Concrete Appliances Company and William H. Insley v. Dietrich Meinken et al., and that the decision of said Court was handed down January 6, 1920.

7. Plaintiffs further aver that their rights under the aforesaid letters patent have been generally recognized and acquiesced in throughout the United States.

8. Plaintiff William H. Insley further avers that he is actively engaged in the manufacture and sale of apparatus embodying the invention set forth in the aforesaid letters patent; is fully and adequately equipped to promptly supply the demand therefor, and that he has offered apparatus manufactured under his authority to the defendants herein, in substitution for the infringing apparatus, and at a reasonable price; and further avers that the use of the aforesaid infringing apparatus by the defendants herein in violation of plaintiffs' rights under the aforesaid letters patent, tends to and does actually encourage infringement by others and that continued use of said infringing apparatus will tend to and actually will encourage others to produce infringing apparatus for their own use and that such infringements so encouraged will and do greatly damage plaintiffs herein, all in violation of the rights of plaintiffs under the aforesaid letters patent.

9. By reason of the foregoing, the plaintiffs pray the Court to issue [fol. 15] an injunction, both provisional and perpetual, restraining the defendants, and each of them, and all of their joint and several agents, employees, officers, and confederates, from making, using or selling, apparatus of the kind described in the aforesaid Letters Patent No. 948,719, or like the apparatus complained of, or similar thereto; to award to the plaintiffs the damages they have sustained, or may hereafter sustain, by reason of the infringement herein complained of; to require the defendants to account for the several profits which they have enjoyed, or may hereafter enjoy, through said infringement; and to grant to the plaintiffs such further relief as the equity of the case may demand, and to the Court may seem proper.

Concrete Appliances Company, William H. Insley. Hood & Schley, Solicitors. 908 Hume-Mansur Building, Indianapolis, Ind. Arthur M. Hood, Cyrus N. Anderson, of Counsel.

July 15, 1920.

[fol. 16] Jurat showing the foregoing was duly sworn to by Wm. H. Insley omitted in printing.

In United States District Court

Answer—Filed Sept. 20, 1920

The defendants, John E. Gomery, John C. Schwartz, Michael J. O'Meara and Concrete Construction Company, file this their answer to the bill of complaint herein, and say:

1. Defendants admit, for the purpose of this suit, the citizenship and residence of the parties to said suit as alleged in the bill of complaint; admit the issuance of United States Letters Patent 948,719 February 8, 1910, to Concrete Appliances Company, one of the plaintiffs herein, upon an application filed January 21, 1909, by Lee [fol. 17] Callahan; deny proper notice of the existence and alleged ownership of said letters patent and of the alleged infringement thereof prior to the filing of the bill of complaint herein; are not informed as to the allegations of paragraph 5 of the bill of complaint with reference to marking the apparatus, and therefore deny said allegations; admit the use at the location, in Philadelphia, specified in paragraph 5 of said bill of complaint, of apparatus illustrated in three photographs dated July 14, 1920, Exhibit No. 1, Exhibit No. 2 and Exhibit No. 3, which exhibits accompanied the affidavit of one Henry T. Pierce, executed July 24, 1920, and filed in this cause in support of a motion for preliminary injunction, this admission applying only to the apparatus in so far as it is revealed in said photographs, defendants expressly denying the use of apparatus such as covered by the written description in said affidavit and in said bill of complaint.

2. Defendants are not notified, save by said bill of complaint, as to the allegations contained in paragraphs 2 and 3 thereof, in so far as they relate to the title of said patent, and therefore, upon information and belief, deny such allegations.

3. Defendants deny the allegations of paragraphs 4 and 7 of said bill of complaint, and aver on information and belief that plaintiffs' alleged rights under said patent have not been generally acknowledged and acquiesced in by the public; but aver, on the contrary, there has been a marked lack of acquiescence and denial of said rights, as evidenced in part by past litigation based on said patent.

4. Defendants are informed and believe that said Letters Patent 948,719 are invalid and without force and effect, either at law or in equity, and so allege, for the reasons that (a) the things patented [fol. 18] therein and thereby were not patentable inventions or discoveries under the statutes of the United States at the time the said Lee Callahan made his alleged or supposed invention or discovery; (b) that the things patented therein and thereby did not involve invention under the statutes of the United States in view of the existing state of the art at the time the said Lee Callahan made his alleged or supposed invention or discovery; (c) that the things patented therein and thereby had been patented and described in printed publications and had been in public use and on sale in the United States prior to

the alleged or supposed invention or discovery thereof by the said Lee Callahan, and more than two years prior to the filing of his application for the said Letters Patent 948,719; and (d) that the said Lee Callahan was not the first or original inventor or discoverer of any material part of the things patented.

5. Defendants admit that the said Callahan Patent 948,719 was sustained by the United States Circuit Court of Appeals for the Sixth Circuit as to claims 1, 2, 5, and 13, but deny that said decision established the validity of said patent, or of any of said claims, as the evidence before the Court in said Sixth Circuit was insufficient to disclose properly the condition of the prior art, leading to an erroneous conclusion as to the alleged advance made in said art by the said Lee Callahan and as to the validity of said claims.

6. Defendants deny infringement of the said Patent 948,719 by the use of the said Philadelphia apparatus complained of, or of any other apparatus, and deny that said apparatus is substantially identical with the apparatus held to be an infringement by said Sixth Circuit Court of Appeals.

[fol. 19] 7. Defendants further deny the conspiracy alleged in paragraph 5 of the bill of complaint, and deny that they are now manufacturing, using, or selling apparatus in infringement of said patent; and deny the alleged intent of further infringement.

8. Defendants are not informed, save by the bill of complaint, of the allegation of paragraph 8 of said bill, and therefore deny each and every of such allegations.

9. Defendants are informed and believe, and therefore allege, that said Letters Patent No. 948,719 are invalid and without force or effect, either at law or in equity, because the things patented therein and thereby were, prior to the alleged or supposed invention or discovery thereof by the said Lee Callahan, and in certain cases more than two years prior to the application for said letters patent, known to and in public use and on sale in the United States by the following:

The Ferro Concrete Construction Company in 1903, in the erection of the Ingalls Building, Fourth and Vine Streets, Cincinnati; and elsewhere.

Jean Jameton in 1905, in the erection of the Farragut School, St. Louis, Mo.

Arthur L. Smith in 1906, in the erection of the Lynn Haven Hotel, Norfolk, Va., and in 1907 in the erection of the Vinery Building, Norfolk, Va.; and elsewhere.

Theodore Emtman in 1907, in Los Angeles, Cal.

Edward C. Gerhard in 1907-08, in St. Louis, Mo., in the erection of the Clark school.

Gray-Wimmer Construction Company in 1908, in the erection of the Coliseum Building, Twenty-fifth Street and Washington Avenue, St. Louis, Mo.; and elsewhere.

[fol. 20] Gilsonite Construction Company, St. Louis, Mo., in the erection of the Baden reservoir in 1903-1906.

American Theatre and Hotel Building, Seventh and Market Streets, St. Louis, Mo., in 1907.

Tootle-Campbell Dry Goods Company building, St. Joseph, Mo., in 1908.

Lee D. Lewman and Manhattan Construction Company, of Muskogee, Okla., the apparatus being assembled at Fort Smith, Ark., in 1907, and similar apparatus being used subsequently in Oklahoma City, Okla.

R. Kletting, in 1907-08, in the erection of the McIntyre Building, Main Street, Salt Lake City, Utah.

T. E. Jewett, in 1908, in the erection of the Majestic Theatre in Houston, Texas, and subsequently.

Pennsylvania Railroad Company elevator in 1903, Germantown Junction, Pa., designed by George M. Moulton & Company, Chicago, and built by Seeley, Son & Company, of Fremont, Neb.

West Shore Railroad Company Elevator, in 1902, Weehawken, N. J., designed and built by George M. Moulton & Company, Chicago.

Redman-Magee Elevator Company, Cairo, Illinois, in 1903, designed and built by George M. Moulton & Company, Chicago.

Consolidated Elevator Company extension to their Elevator E in 1899, Duluth, Minn., designed by Moulton-Starrett Company and built by the Barnett & Record Company, Minneapolis, Minn.

Albert E. Kulp and George Botzung, at Cincinnati, Ohio; John S. Bronson, Herman A. Bankes, W. L. Wimmer, John W. Goebel, Eugene Taylor, George W. Herthel, W. J. Knight, all of St. Louis, Mo.; and W. C. Englar and John M. Witherspoon, both of Chicago, Illi- [fol. 21] nois. And also known to and used by various other persons and concerns, whose names and the places of their prior uses, public uses, and sales are not known to these defendants, but which it is prayed may be inserted herein by amendment, when known to these defendants subsequently, to make this answer more definite and certain in those respects.

10. The following patents, names of parties mentioned in said patents as evidence of prior invention and prior knowledge and use, printed publications and users are among those supporting these defenses and to which defendants make reference, to wit:

69,375, Oct. 1, 1867, Van Voorhis.
243,327, June 21, 1881, Toepfer.
366,468, July 12, 1887, Edwards, et al.
371,343, Oct. 11, 1887, McLennan.
426,301, April 22, 1890, Musgrave, et al.
445,645, Feb. 3, 1891, Simpson.
524,984, Aug. 21, 1894, Robinson.
556,371, Mar. 17, 1896, Rasch.
560,382, May 19, 1896, Walsh.
582,598, May 11, 1897, Bird.
605,375, June 7, 1898, Bellinger.
622,019, Mar. 28, 1899, Robinson.
694,579, Mar. 4, 1902, Ransome.
702,372, June 10, 1902, Montgomery.

718,092, Jan. 13, 1903, Clarke.
721,215, Feb. 24, 1903, Metzger.
753,616, Mar. 1, 1904, Nicholson.
760,015, May 17, 1904, Parker.
769,126, Aug. 30, 1904, Adams.
830,385, Sept. 4, 1906, Wallace.
862,874, Aug. 13, 1907, Beach.
866,166, Sept. 17, 1907, Theiss, et al.
875,529, Dec. 31, 1907, Joehnck.
948,723, Feb. 8, 1910, Emtman.
969,172, Sept. 6, 1910, Lonney.

[fol. 22] English Patents

1,124, May 24, 1864, Potter.
3,107, Oct. 22, 1872, Ellington, et al.
2,017, May 18, 1880, Johnson.
10,380, July 17, 1888, Baillie.
16,525, Sept. 3, 1895, Roe.
19,554, Sept. 10, 1903, Holland, et al.

Publications

Engineering News, July 30, 1903, page 97.
Concrete, January, 1905, page 23.
The Cement Era, 1906, Vol. IV, page 24.
The Cement Era, 1907, Vol. V, page 154.
Engineering Record, October 12, 1907, page 405.
Engineering Record, November 2, 1907, "Heavy Foundations for the New Steel Works at Gary, Ind."
Concrete Engineering, November, 1907.
The St. Louis Republic, February 16, 1908, page 3, article entitled "New American Theatre Opening Tomorrow Is Model of Handsome and Safe Play House Construction."
"Buildings of Character," a catalogue published by the Gray Construction Company of St. Louis, Mo.

Said alleged invention is also disclosed in other Letters Patent of the United States and foreign countries which are not now known to these defendants, but which it is prayed may be inserted herein by amendment when known to these defendants, to make this answer more definite and certain in those respects.

11. These defendants are informed and believe, and therefore allege, that the said Lee Callahan was not the original and first inventor or discoverer of any material and substantial part of the thing patented, and that he and his assignee, Concrete Appliances Com-[fol. 23] pany, a corporation of Missouri, surreptitiously or unjustly obtained a patent for that which was in fact invented by others, who were using reasonable diligence in adapting and perfecting the same, to wit, the individuals mentioned in the preceding paragraphs 9 and 10.

12. These defendants deny the allegations of the bill of complaint which have not been hereinbefore denied or admitted, and allege that the plaintiffs have no cause of action against them, all of which they are ready to maintain and prove, as this Honorable Court shall direct, and pray that the plaintiffs' bill of complaint be dismissed and that these defendants be discharged with their costs and expenses in this behalf most wrongfully sustained.

John E. Gomery, John C. Schwartz, Michael J. O'Meara, Concrete Construction Company, Defendants. Sheridan, Jones, Sheridan & Smith, by Thomas H. Sheridan, Solicitors for Defendants, Marquette Building, Chicago, Illinois.

IN UNITED STATES DISTRICT COURT

STIPULATION FOR AMENDMENT TO ANSWER—Filed September 25, 1920

(The references in this stipulation refer to the original record.)

It is hereby stipulated and agreed that the answer of Gomery, et als., in the above-entitled cause shall be corrected as follows:

Page 2, line 6, after "affidavit" insert —and—.

Page 5, line 4, cancel the numeral "3" and the comma following it.

[fol. 24] Page 5, line 10, insert the word —Building— after "Tootle Campbell Dry Goods Company."

Page 5, fifth from last line, correct the spelling of "George."

Cyrus N. Anderson, for Plaintiffs. Wm. Steell Jackson, for Defendants.

Philadelphia, Pennsylvania, September 24, 1920.

IN UNITED STATES DISTRICT COURT

AMENDMENT TO ANSWER

(The references in this amendment to answer refer to the original record)

Defendants hereby amend their answer as follows:

Page 4 of the printed copy, line 2, change "allegation" to allegations.

Lines 11 and 12, change "and" to or.

Line 16, erase "1905 in the erection of the Farragut School."

*Line 19, erase "and."

*Line 20, before "and" insert —in 1908 in the erection of the St. Louis Coliseum Building.

*Line 22, change "1907-8" to 1905-10.

*Line 23, change "Clark School" to —Farragut, Clark and Franklin Schools.

Lines 28 and 30, change the period to a semicolon.

Page 5, line 1, change the date to 1908-9.

Line 3, change "1908" to 1909.

After the seventh paragraph ending with "Illinois," insert the following:

Bates and Rogers Construction Co., Chicago; Illinois Central Railway, Paydras St. Warehouse, New Orleans; A. Bentley & Sons Co., Toledo, Ohio; James Stewart & Co. of Chicago; Great Lakes Dredge & Dock Co., Chicago, Detroit, Toledo, Cleveland; Webster Mfg. Co. [fol. 25] of Chicago; Geo. B. Swift Co. of Chicago.

Blast Furnace No. 3, 1908, Tenn. Coal & Iron Co., Birmingham, Ala.; Masonic Temple, Toledo, Ohio, 1904; Utah Copper Co., Garfield, Utah, 1906; Utah Trust & Savings Bank, Salt Lake City, Utah, 1906; McGraw Building, New York City, 1906-07; Dickson Building, Norfolk, Va.; New York Central Railway, Detroit River Tunnel; Gary Steel Plant, Gary, Ind.; Iroquois Iron Co., South Chicago, Ill.; Round House, Richmond, Cal.; Cambridge Bridge, Boston, 1902; D. L. & W. Railway Bridge 27, near Waverly, Pa., 1904; Connecticut Ave. Bridge, Washington, D. C.; Big Trees, Cal., 1906; C. M. & St. P. R. R. Bridge Z 988, Pickering, Ia., 1906; Baltimore & Ohio Railway, Baltimore Coal Dock, 1900; Weber Dam, Lyon, Michigan, 1906; *Healy & Tibbetts Construction Co., Piers 42 and 44, San Francisco, Cal., 1906.

James R. Gloyd, Cleveland, Ohio; J. W. Thompson, New Orleans; J. S. Ruble, Cleveland, Ohio; J. L. Mensch, Chicago; W. R. Sinks, Chicago; R. S. Folwell, Chicago; J. R. Williams, New York; Frank B. Gilbreth, Montclair, New Jersey; M. J. Hauser, Pasadena, Cal.; Charles A. Fellows, Los Angeles, Cal.; W. H. Kirkland, San Francisco, Cal.; Lewis A. Hicks, Berkeley, Cal.; John G. Howard, Berkeley, Cal.; J. E. McDonald, Oakland, Cal.; Albert Lunde, Adams, Minn.; Wm. T. McCann and Alexander Cameron, both of Chicago.

*Fount M. Woodward, Andrew W. Woodman, Henry O. Webb, Jerome C. Alderman, Alexander C. Patterson, Carl T. Anderson, Louis A. Stinson, Howard C. Blake, Harold D. Squires, D. J. Fucik, R. H. Hughes, all of Chicago, Ill.; Robert B. Preston and Town- [fol. 26] send A. Tatterson, of Norfolk, Va.; Samuel C. Black, F. C. Bonsack, and James L. Hopkins, all of St. Louis, Mo.; Hugh Bryson, L. A. Parker, Luther M. Hill, Swan P. Johnson, and Kurt O. Wetzel, all of Los Angeles, Cal.; Charles C. Horton, Martin E. Brown and Fred L. Ayers, all of San Franisco, Cal.; William G. Fargo and Harold S. Hunt, of Jackson, Mich.; and Fred Brunner, Pittsburgh, Pa.

Add to the list of publications on page 7, ending "St. Louis, Missouri," the following:

Publication	Date	Page	
Engineering Record	May 30, 1903	575	Danville Dam;
" "	July 9, 1904	40	New Croton Dam;
" "	Nov. 26, 1904	619	Morris & Essex Div., Lackawanna R. R.;
" "	July 28, 1906	88	Chalmette Docks, New Orleans, La.;
" "	Aug. 25, 1906	200	Manhattan Bridge;
" "	Nov. 10, 1906	523	Hotel Traymore, Atlantic City;
" "	Jan. 19, 1907	74	Washington Apartments;
" "	July 6, 1907	13	Chain of Rocks, St. Louis;
" "	July 13, 1907	32	Track Elevation;
* " "	Oct. 19, 1907	418	Three Low Head, etc.;
* " "	Oct. 26, 1907	462	Three Low Head, etc.;
" "	May 1, 1909	564	Painsville Bridge;
" "	Apr. 3, 1909	424	Upson Nut Co. Dock;
" "	Dec. 11, 1909	650	Surety Building, Muskogee, Okla.;
* " "	Feb. 14, 1914	177	Editorial on Autoclave Test;
* " "	May 16, 1914	551	Autoclave Cement Patent;
Engineering News	June 2, 1892	554	Cascades Canal, Oregon;
* " "	Feb. 28, 1901	149	Cement Mixing Machine;
" "	Oct. 17, 1901	282	New Cambridge Bridge;
[fol. 27]			
" "	Dec. 25, 1902	537	Depositing Concrete by Chutes;
* " "	July 30, 1903	90-93	Ingalls Building;
" "	Mar. 2, 1905	214	Double Track Work by John W. Ash;
" "	Mar. 16, 1905	287	Masonic Temple, Toledo, Ohio;
" "	Mar. 30, 1905	330	C., M. & St. P. Bridge at Kilbourn, Wis.;
" "	Apr. 19, 1906	437	City of Mexico Structure;
" "	May 31, 1906	606	By W. G. Fargo, of Jackson, Mich.;
* " "	Aug. 12, 1915	289, 306, 316, 318, 321	Several articles;
Engineering Contracting	June 27, 1906	75	Street Mixer & Boom;
Engineering Contracting	Sept. 26, 1906	81	Philadelphia Rapid Transit Co.;
Engineering Contracting	Nov. 4, 1908	291	Paving Apparatus
Mines and Minerals	Dec. 1903	205	Article by S. H. Lea.

Books and Catalogues

Publication	Date	Page	
On Limes, Hydraulic Cements and Mortars.	1890	236	Gilmore;
Reinforced Concrete	1906	187	Chas. F. Marsh;
Concrete, Plain and Reinforced.	1905	368, 369 & 371	Taylor & Thompson;
Concrete & Reinforced Concrete.	1907	108	Reid;
Concrete System	1908	49, 103, 57	Frank Gilbreth;
Concrete Construction	1908	216	Gillette & Hill;
Michigan Engineer	1905-1908	144	Wm. G. Fargo;

Publication	Date	Page	
Transactions of American Society of Civil Engineers, Vol. LIV, Part E.	1904	463 596 610	
Transactions of American Society of Civil Engineers, Vol. LX.	June, 1908	494 453-56 481	Article on McGraw Bldg.;

[fol. 28]

*Construction of Masonry Dams.	1915	66 64	
Proceedings of the National Association of Cement Users, Vol. 6.	1910	188 203 326 511	W. C. Smith;
Grain Elevator Construction.	1902		G. M. Moulton & Co., Chicago;
Ransom Concrete Machinery Handbook.	1906		
Webster Mfg. Co., Catalogue M.	1901		
Great Lakes Dredge & Dock Company's Catalogue.	1912		

Page 6, in the list of United States patents, insert the following in numerical order:

*464,101, Dec. 1, 1891, Mayo,
*667,335, Feb. 5, 1901, Record,
*681,378, Aug. 27, 1901, Shoemaker,
711,825, Oct. 21, 1902, Clarke,
714,150, Nov. 25, 1902, Clarke,
*939,072, Nov. 2, 1909, Ney.

Also add the following British patent:

*Gibbs, 7,307 of 1908, application filed April 2, 1908, accepted April 1, 1909.

Page 7, line 16, change "patent" to patents and publications; and after line 30, insert:

*Defendants allege that the concrete distributing devices used by them in the construction of their building are not described or claimed in said Letters Patent 948,719, and that said suit as maintained against them and more particularly against the defendant Concrete Construction Company, charging it with infringing certain claims of said Letters Patent, is, in effect, a cloud upon its right to [fol. 29] conduct its business in a lawful manner, i. e., the construction of buildings in the City of Philadelphia and elsewhere; and defendant prays—

1. That said letters patent may be declared invalid; and

2. That the said devices heretofore used and being used by said defendant in the construction of buildings may be held not to be an infringement of any claim of said letters patent.

George Bayard Jones, Solicitor for Defendants.

Chicago, February 2, 1921.

I hereby consent to the foregoing amendment [the parts not marked with asterisks (*)] without waiving the right to imposition of terms by the Court.

Arthur M. Hood, Solicitor for Plaintiffs.

September 30, 1921.

The portions marked with asterisks, (*), except the insertion for line 30, page 7, which have been added to the amendment since February 2, 1921, are hereby consented to without waiving the right to imposition of terms by the Court.

Arthur M. Hood.

Approved: —— ——, U. S. District Judge.

[fol. 30] IN UNITED STATES DISTRICT COURT

DEFENDANTS' INTERROGATORIES TO PLAINTIFFS—Filed October 15, 1920

Now come the defendants, by their solicitors, and propound the following interrogatories for answer by plaintiffs.

The alleged infringing structure shown in your three photographs of July 14, 1920, Exhibits Nos. 1, 2 and 3, which accompany the affidavit of Henry T. Pierce, executed July 24, 1920, comprises what you have termed in said affidavit three units i. e., tower A with its associated appliances, and two towers B with their associated appliances, units A and B representing two different kinds of concrete distributing apparatus as follows:

(A) Apparatus comprising a tower A, hoist bucket 1, elevated hopper 2, and one or more lines of chutes supported from a cable secured to the upper part of the tower and to a distant point.

(B) Apparatus comprising a tower B, hoist bucket 1, elevated hopper 2 on a frame 3 slidably supported on the tower B, and a trussed chute or conduit 4 pivoted to the frame 3 at one end and supported from the tower by block and tackle 6 at the other end.

Interrogatory 1. Do you allege that the apparatus of paragraph A is an infringement of Callahan Patent 948,719?

Interrogatory 2. Do you allege that the apparatus of paragraph B is an infringement of Callahan Patent 948,719?

[fol. 31] The foregoing interrogatories are filed in lieu of defendants' prior interrogatories dated September 21, 1920, which latter are hereby withdrawn.

John E. Gomery, John C. Schwartz, Michael J. O'Meara, Concrete Construction Company, Defendants, by Sheridan, Jones, Sheridan & Smith, Solicitors.

Chicago, September 28, 1920.

Service hereby acknowledged of a copy of the foregoing interrogatories September 29, 1920.

Hood & Schley, Solicitors for Plaintiffs.

IN UNITED STATES DISTRICT COURT

PLAINTIFFS' ANSWERS TO DEFENDANTS' INTERROGATORIES—Filed October 11, 1920

Now come the plaintiffs by their solicitors, and answer defendants' interrogatories as follows:

Answer to interrogatory No. 1. As the construction and operation of tower A is at the present time understood, no claim of infringement is made by plaintiffs against the same.

Answer to interrogatory No. 2. Yes.

Concrete Appliances Company, William H. Insley, by Hood & Schley, Solicitors for Plaintiffs.

October 7, 1920.

[fol. 32] IN UNITED STATES DISTRICT COURT

DEFENDANTS' ADDITIONAL INTERROGATORIES TO PLAINTIFFS—Filed December 23, 1920

Now come the defendants, by their solicitors, and propound the following interrogatories for answer under oath by plaintiffs.

1. State which claims of the Callahan patent in suit you will rely on at the hearing.

2. What is the earliest date of the alleged invention of the structures of the respective claims of the Callahan patent relied on in this suit? Answer for each claim.

John E. Gomery, John C. Schwartz, Michael J. O'Meara, Concrete Construction Company, Defendants, by George Bayard Jones, Solicitor.

Service hereby acknowledged of a copy of the foregoing interrogatories December 16, 1920.

Arthur M. Hood, Solicitor for Plaintiffs.

Before Dickinson, J.

It is hereby ordered and decreed that the foregoing interrogatory be answered by the solicitor for the plaintiffs within ten days of the date of this order.

By the court.

Attest:

Leo A. Lilly, Deputy Clerk.

[fols. 33 & 34] IN UNITED STATES DISTRICT COURT

ANSWER TO INTERROGATORY NO. 1 OF DEFENDANTS' ADDITIONAL INTERROGATORIES TO PLAINTIFFS—Filed January 8, 1921

Defendants, by their solicitor, on December 23, 1920, having presented a motion that interrogatories numbered 1 and 2 presented in defendants' additional interrogatories to plaintiffs be answered, and it having been agreed and ordered that interrogatory numbered 1 should be answered by plaintiffs' solicitor and that interrogatory numbered 2 should not be answered:

Now come the plaintiffs, by their solicitor, and answer interrogatory numbered 1 as follows: that as at present advised and as previously stated plaintiffs will rely at the trial of this suit upon claims 1, 2, 5 and 13, which are the claims specified in paragraph numbered 6 of the bill of complaint.

Cyrus N. Anderson, Solicitor for Plaintiffs.

[fol. 35] IN UNITED STATES DISTRICT COURT

[Title omitted]

Depositions of witnesses taken before F. C. Tilghman, a notary public for the city of Norfolk, Virginia, pursuant to notice and agreement, at the office of Phlegar & Tilghman, Law Building, Norfolk, Virginia, May 2, 1921, at 10 o'clock a. m., to be read as evidence on behalf of the plaintiffs in the above-entitled cause, pending in the United States District Court for the Eastern District of Pennsylvania.

Present: Mr. Cyrus N. Anderson for the plaintiffs; Mr. Glen E. Smith for the defendants.

[fol. 36] It is agreed that F. C. Tilghman may act as Notary instead of H. H. Chalkley whose name appears in the notice.

CHARLES COOPER (col.), being first duly sworn, testified on behalf of the plaintiffs as follows:

Examined by Mr. Anderson:

Q. 1. What is your name?
A. Charles Cooper.
Q. 2. What is your age?
A. I will be 40 years old the 7th of this coming May, born in 1881.
Q. 3. What are you doing now?
A. I run a huckster wagon.
Q. 4. Did you ever work for a man by the name of E. Tatterson?
A. Yes, sir.
Q. 5. Did you work on the Lynnhaven Hotel Building?
A. Yes, sir.
Q. 6. About when was that?
A. As near as I can come at it, it was about 1906. I think that was the year I started working there.
Q. 7. Just what did you do when you worked on that building?
A. I bent steel and rolled concrete and helped tear down when they wasn't concreting,—tear down the forms. I was just a workman around there. I done anything they asked me to do.
Q. 8. Did you do any grading of concrete?
A. Yes, sir, I graded some.
Q. 9. Did you haul any of the concrete in wheel barrows?
[fol. 37] A. I did, yes, sir.
Q. 10. Do you know how the concrete was poured or laid in that work?
A. All I know, they just had men there to roll the cement and gravel and sand into the hopper and the hopper would have a mixer there to turn it over and after it got mixed they would put the wheel barrow right up under the mouth of the hopper and the fellow there would let it shoot up and let it come down until the wheel barrow got full and he would cut it off and the men out on the floor would dump it and there would be a man out there with a rake and a tamper to smooth it down and tamp it down.
Q. 11. That is, the concrete was poured right out from the hopper into a wheel barrow?
A. Yes, sir.
Q. 12. And then was hauled in the wheel barrows to different places in the building; is that what you mean?
A. Right out on the floor, yes, sir.
Q. 13. After that it was graded and tamped?
A. Tamped, yes, sir.
Q. 14. Did you ever see any troughs used in the discharge of that concrete from the hopper?
A. No, sir, I didn't see them. The only trough about the hopper was just a little chute, I guess, about that long and about that wide just where the concrete run out of the hopper into the wheel barrow and he would cut it off. That is the only chute that was anywhere

around when I was there and I worked there from the first floor clean up to the top and left there and went over to the building right across the street.

Q. 15. Is that the Vinery Building?

[fol. 38] A. Yes, where Levy's store is now, I think. Mr. Levy has got a furniture store there.

Q. 16. Did you work on that Vinery Building?

A. Yes, sir.

Q. 17. Do you happen to remember about when they finished the concrete part of the work on the Lynnhaven Hotel?

A. What year, you mean?

Q. 18. Yes. You started in 1906 and about when did you finish up the concrete on that Lynnhaven Building, if you remember?

A. I just don't remember but I know I worked there clean until it was finished all right. I don't want to tell nothing wrong.

Q. 19. Over on the Vinery Building how was the concrete distributed on the floors?

A. Just by wheel barrows.

Q. 20. Were any troughs used over there?

A. No, sir, nothing but a hopper, transferred the same things right over there, right over to the Vinery Building.

Q. 21. What work did you do over on the Vinery Building?

A. I went over there to the Vinery Building and Mr. Smith put me down in the hole, tamping and leveling the concrete, leveling it down to a certain gauge of the steel after we got over there. He put me down with another fellow, leveling the cement off and tamping it down. Of course, the way that was, they just had a board coming right from the hopper, a run-way where you could run a wheel barrow over it, run the wheel barrow up there and dump it over in that hole and we would tamp it down and level it off. That would [fol. 39] be for the foundation. That was to make the steel in one position, you know, solid.

Q. 22. How about the floors? Did you do the floors the same way?

A. Yes, when they got up high enough to work the floors he would build a stage so the elevator could come up and bring the sand and gravel like that to dump it in the hopper.

Q. 23. The hopper was just above the floor level, was it?

A. Yes, sir.

Q. 24. How high above the floor level?

A. The hopper is just high enough so you could run a wheel barrow underneath it.

Q. 25. Was that the same over in the Lynnhaven Building?

A. Yes, sir.

Q. 26. And you don't remember seeing any troughs in neither building?

A. Neither building.

Q. 27. How long did you work in the Vinery Building?

A. I worked there in the Vinery Building until all the concreting was over, until they commenced tearing down the forms, commenced tearing down all the forms.

Cross-examination by Mr. Smith:

X Q. 28. How are you able to determine the date when you started this work on the Lynnhaven Hotel? How are you able to fix the date when you started this work on the Lynnhaven Hotel?

A. How was I able to fix the date?

[fol. 40] X Q. 29. You said you began work there in 1906. How do you know it was 1906?

A. I know I got married in 1905 and I was working down at Lamberts Point soon after I got married and I left Lamberts Point and come to work for the Virginia Railway & Power Company and then I left the Virginia Railway & Power Company and went to work for the Lynnhaven Hotel because some of the fellows had been working for the Virginia Railway & Power Company and were getting more at the Lynnhaven Hotel than they was getting from the Virginia Railway & Power Company and I seen them and they told me I could get more at the Lynnhaven Hotel than I could at the Virginia Railway & Power Company and I left there and went to work there.

X Q. 30. About what time of the year 1906 did you begin work there?

A. Well, I don't just know the month but I know it was kind of in the summer time because I was working in my shirt sleeves. It wasn't cold, I know. Just to say what time of year it was, I don't know.

X Q. 31. Was the concrete work on this hotel rushed along? Did they work on it as fast as they could in order to finish it up?

A. Yes, they would work on it some nights until 10 or 11 o'clock. Of course, if we would start a floor and couldn't finish it by time to knock off Mr. Smith would holler down stairs and tell the boys "We want you all to work tonight until we finish this floor." That might be until 10 or 11 o'clock before they finished.

[fol. 41] By Mr. Anderson:

R. D. Q. 32. Do you know whether that was Arthur L. Smith?

A. I know it was the old man.

R. D. Q. 33. Was it the Smith in charge, the superintendent?

A. Yes, sir. I don't know whether his name was Arthur L. Smith but I know his name was Mr. Smith.

By Mr. Smith:

R. D. Q. 34. Do you recall whether the concrete work was completed on that building before cold weather in that year?

A. Yes, sir, if I am not mistaken, I think it was before cold weather.

R. D. Q. 35. You have stated a while ago that you bent steel and did a lot of other jobs of that kind with respect to work around the building. Do you remember how much time you put in on bending steel and so on? Were you on that kind of work a large part of the time?

A. The most of my time after getting on the first floor there, me and another fellow was bending steel. The onliest time Mr. Smith would call on us for us to work on the concrete would be when they would get in a rush and want to finish up that floor because they wouldn't want the cement to set.

R. D. Q. 36. That is the only time you worked on the concrete?

A. Yes, sir, when he would call on us because me and Lewis was bending steel until they got over there to this Vinery Building and then they took us off steel and put us on the concrete.

[fol. 42] R. D. Q. 37. During the construction of the Lynnhaven Hotel then you only worked on the concrete occasionally?

A. Yes, sir, just occasionally, not for a regular thing.

R. D. Q. 38. You weren't on that concrete work continuously all the time?

A. Continuous right along, no, sir; but I was there until the job was finished.

R. D. Q. 39. You were around the building?

A. Yes, sir, working from bottom to top.

R. D. Q. 40. But you weren't always up where the concrete was actually made?

A. Yes, because I used to go up and put the steel in and wire it.

R. D. Q. 41. You carried it up there?

A. Yes, sir, great long gutters. I guess it would be a pillar, just the same as a joist. I don't know what you call it.

R. D. Q. 42. How large a building is this Lynnhaven Hotel? Does it cover half a block or what would you say is the size of it?

A. No, sir, it don't cover a half block. About as near as I could get at it, the Lynnhaven Hotel is near about as big as that building right there or maybe a little bigger.

R. D. Q. 43. When you were working on that concrete you were carrying the steel up there to lay it in place and you were always at the place where the concrete was being laid; is that it?

A. Yes, sir.

R. D. Q. 44. You didn't work around the hopper?

A. Yes, sir, sometimes I would be around the hopper when they would put me rolling a wheel barrow.

[fol. 43] R. D. Q. 45. You didn't work on the wheel barrows, did you?

A. What?

R. D. Q. 46. Did you work on the wheel barrows?

A. Sure, I rolled them all right.

R. D. Q. 47. You did that occasionally?

A. Yes, whenever they would be in a rush they would call for me and Lewis to come up and help roll the wheel barrows, especially at night.

R. D. Q. 48. You did any job they happened to call on you to do?

A. Yes, I did anything they called on me to do, tear down and tore out and do anything they said to do.

R. D. Q. 49. Troughs might have been used in connection with this hopper without your having seen them?

A. No, sir, if they had been used I could have seen it.

R. D. Q. 50. You weren't up there all the time where the hopper was being used?

A. I know I wasn't but if they could put a trough on I know it would take time and they wouldn't have all that time to have it done. What I speak about a trough, a trough is something to put concrete here and trace it all the way around, but they didn't have nothing like that.

R. D. Q. 51. You don't remember anything of that kind?

A. No, sir, I don't remember anything like that.

R. D. Q. 52. Did you work on other concrete buildings after the Vinery Building?

A. No more than them two.

R. D. Q. 53. What have you been doing since that time?

A. Well, I have been doing long shore work and pile driving work and working for the Virginia Railway & Power Company. I went back to work for those people. I worked with them ten years [fol. 44] and then commenced with the war I stopped with them and went to work for the long shore and pile driving and when they stopped that I went to work for myself, but the onliest building I ever seen in Norfolk with a hopper on it was this building out here by the Norfolk & Western Railroad, a gas house out there. That is the only building I seen with a hopper on it. That had a hopper with a chute on it and concrete would run down and they would take the chute and carry it anywhere all over the place like that and spread the concrete. That is the onliest one I ever seen. I think that was the one.

R. D. Q. 54. Where was that?

A. Out on the Norfolk & Western Railroad track.

R. D. Q. 55. Has anything happened since 1906 to recall this Lynnhaven Hotel job to your mind?

A. No, sir, not to my knowledge.

R. D. Q. 56. When was it first brought to your attention now?

A. What is that?

R. D. Q. 57. This Lynnhaven Hotel job?

A. This gentleman first brought it to me I just happened to meet Mr. Kerns last Monday down here and I had a long talk with him about where he had been and he said he had been looking for me on a job to work but he didn't say nothing to me about no hotel or nothing like that and this morning I was upstairs and the door bell rang and my wife went to the door and somebody said they wanted to see Charlie Cooper and I went down and it was Mr. Kerns and he told me to come down to the Monticello Hotel and then I come in there and wondered what business I had to do down there. I never had no business in the Monticello Hotel and he said there was [fol. 45] a gentleman down there who wanted to see me on behalf of something about the Lynnhaven Hotel. I told him I would be down here about ten o'clock.

R. D. Q. 58. About how many other workmen were employed on this building, in the same kind of work that you did?

A. Well, I reckon nearly fifty men or a hundred men, white and colored.

R. D. Q. 59. Do you know whether any of those men are around here now?

A. I think I know where one or two of them are at. I think, if I am not mistaken, I can get the very boy that worked right at the hopper. I seen him last Saturday night. I don't know where I could locate him now. He goes and comes so much, but he is the boy that worked right at the hopper.

R. D. Q. 60. Did all of these fellows do the same work that you did, tamping cement and grading it and so on?

A. Yes, sir. Mr. Butts is a white gentleman. I think he lives in Berkley, if you could get hold of him. He could give you the details of it because he built all the forms for the concrete.

Signature waived by agreement of counsel.

WILLIAM T. BAKER, being first duly sworn, testified on behalf of the plaintiffs as follows:

Examined by Mr. Anderson:

Q. 1. Please state your name, age, residence and occupation?

A. William T. Baker; 55 years old; residence, Indian River. My address is R. F. D. No. 2, Box 182; occupation, builder.

[fol. 46] Q. 2. With what firm are you connected?

A. Baker-Brinkley Company.

Q. 3. Are they contractors and builders?

A. Yes, sir.

Q. 4. How long have you been engaged in business with Mr. Brinkley?

A. About 12 years or something like that, between 10 and 12 years. I don't know the exact date.

Q. 5. Did you know Mr. E. Tatterson of Norfolk who died some few months ago?

A. Yes, sir.

Q. 6. Were you ever employed by him?

A. Yes, sir.

Q. 7. In what capacity?

A. Superintendent.

Q. 8. Do you remember the building of the Lynnhaven Hotel?

A. Yes, sir, I was with him at the time.

Q. 9. That is now the Southland Hotel?

A. The Southland Hotel.

Q. 10. And were you his superintendent at that time?

A. Yes, sir.

Q. 11. Will you please tell what you know about the building of that building?

A. Well, he had a man, a fellow by the name of Smith who was foreman on that job, who had charge of the construction of it at the time and I visited the job occasionally. Sometimes I would go up

there once a day, sometimes twice a day and sometimes it would be three or four days between the times I was on the job.

Q. 12. Did you make those visits in your capacity as superintendent for Mr. Tatterson?

[fol. 47] A. Yes, sir, I most always went up there when Mr Tatterson would ask me to go.

Q. 13. And when you made those visits there did you go up on the building on the different floors.

A. Yes, I would go around on different floors. Sometimes I would go on the floors and sometimes I wouldn't.

Q. 14. About when was that building started, do you know?

A. Well, I imagine it was started in 1906, maybe the latter part of June or first of July—sometime about that time. I was building the Fairfax at the time and the Paul-Gale-Greenwood and I think it was the first of May when I started the Fairfax.

Q. 15. Do you recall about when the building was completed, the Lynnhaven Hotel Building?

A. I think it was the spring of 1907 or something like that,—some time about that time.

Q. 16. What enables you to fix those dates—anything special?

A. No, nothing special.

Q. 17. Was it built before or after the Jamestown Exposition?

A. It was started before and it was completed some time during the year of the Jamestown Exposition, in 1907.

Q. 18. Do you know whether or not they were trying to complete it so it could be used during the Exposition?

A. Yes, I think they were trying to complete it to use it during the Exposition.

Q. 19. What is your recollecton as to the manner in which the concrete was distributed on the different forms in that building?

[fol. 48] A. My recollection is that is was distributed in wheel barrows on the building and carried up to a hopper by an automatic dumper and dumped into a hopper and distributed from that hopper into wheel barrows on the building.

Q. 20. Where was it mixed, on the street?

A. In the mixer on the street.

Q. 21. On what street was that, do you recall?

A. On Granby street.

Q. 22. Granby or Freemason, which?

A. I think it was near the corner of Granby and Freemason, somewhere along there. I don't remember the exact location of the tower now.

Q. 23. I show you this photograph, Defendants' Exhibit No. 19 and will ask you if you recognize it?

A. Yes, I think I have got one just exactly like that, taken about the time that was. I also had some taken at the Fairfax Hotel at the time.

Q. 24. From that photograph where does it appear that the hoist tower is in which the concrete was carried up?

A. On Freemason Street, back on the far side of Freemason Street.

Q. 25. As I understand, the concrete was mixed down at the base of the tower?

A. At the base of the tower.

Q. 26. And was carried up in an ordinary hoist bucket and when it got to the top of the tower what happened to it then?

A. There was an automatic dump. It run over and tilted it right over into the hopper.

[fol. 49] Q. 27. And then after it got into the hopper what happened to it?

A. It was distributed from the hopper. There is a gate in this hopper that he raises up and dumps it into the wheel barrows from the hopper and it was distributed on the floor from the wheel barrows.

Q. 28. Do you recall actually having seen it dumped out into those wheel barrows and hauled away?

A. Yes, sir.

Q. 29. Do you recall having seen it distributed in any other way?

A. No, I never saw it distributed in any other way at all,

Q. 30. Did you ever see troughs used for distributing it from the hopper around to different places?

A. No, I don't know. He may have used a trough but I didn't see any used. He wasn't using any trough when I was on the job at any time.

Q. 31. You visited the building frequently?

A. Yes, sir, I visited the building frequently.

Q. 32. I show you Defendants' Exhibit No. 20, Smith sketch of Lynnhaven Hotel apparatus, and will ask you if you ever saw any such apparatus as that used for the distribution of the concrete on this building?

A. No, I never seen him use anything like that on the building at all.

Q. 33. It has been testified by Mr. Smith that he used troughs such as are shown in this sketch and perhaps even a third trough for the distribution of the concrete from the fourth to the seventh floor on this building. Do you think it is possible that he could have done that without your seeing it?

[fol. 50] A. No, I don't think he could have poured all that from the fourth to the seventh floors without my seeing it. I don't think it would have been possible for him to have done it.

Q. 33½. What is your recollection as to the height above the floor on which the concrete was being poured?

A. That the tower extended above the floor? You mean the hopper or the tower?

Q. 34. The hopper?

A. Well, we usually use a hopper about three feet from the floor in order to run a wheel barrow under without striking the bottom of the hopper.

Q. 35. In that particular building how high was the hopper from the floor?

A. About three feet.

Q. 36. Now, then, as to the tower on which the hopper was sup-

ported, how far above the floor ordinarily in that particular construction did it extend above the floor?

A. About 18 or 20 feet. We run the tower up something like 18 feet. We would increase the height of the tower with each story and move our buckets up.

Q. 37. Suppose you were pouring the concrete on the fourth floor, do you mean that the tower would run 18 feet above that floor?

A. Yes, something like that, 15 to 16 feet. You understand me there about the tower, I don't mean the hopper was that high. I mean the tower would run up that high.

Q. 38. Did Mr. Arthur L. Smith about the time this building was being constructed, ever say anything to you about the use of any chutes or troughs for the distribution of any concrete?

A. Not that I ever heard of. I don't remember him mentioning it.

[fol. 51] Q. 39. Did Mr. Smith ever talk to you about the use of troughs for the distribution of concrete?

A. At that time?

Q. 40. At any time?

A. No, not until here a short time ago I saw him and he was talking to me about it. That has been less than a year ago. No, he never said anything to me about distributing concrete in chutes.

Q. 41. Did he come to see whether you would remember whether he had used troughs or not?

A. Yes.

Q. 42. And you told him you did not remember it?

A. I told him I didn't remember him ever using any troughs at all.

Cross-examination by Mr. Smith:

X Q. 43. When you were employed by Mr. E. Tatterson were you stationed at the Fairfax Hotel?

A. Yes, I was stationed at the Fairfax Hotel.

X Q. 44. Your job was to supervise the concrete work on that building?

A. No, I was on all jobs, Miller-Rhoads & Swartz, Paul-Gale and the Fairfax Hotel. Those were the jobs that I put my time mostly in on, those three jobs.

X Q. 45. Did you have charge of the work on the Paul-Gale Greenwood Building?

A. Yes, sir.

X Q. 46. Wasn't it a fact that Arthur L. Smith was in charge of the work on the Lynnhaven Hotel?

A. He was in charge of it, yes, sir. He was foreman on the job.

[fol. 52] X Q. 47. Weren't you employed particularly for work on these other buildings and not on the Lynnhaven Hotel?

A. No, I had charge of all of Tatterson's work. I would superintend it. I would go on a job and Mr. Tatterson would ask me to look after anything he wanted done. Mr. Tatterson would ask me to go on a job and I would look after it.

X Q. 48. Were these other buildings which you have mentioned under construction at the same time that the Lynnhaven Hotel was being built?

A. Yes, sir.

X Q. 49. You made occasional visits to the Lynnhaven Hotel?

A. Yes, occasional visits to the Lynnhaven Hotel.

X Q. 50. You have stated on direct examination that troughs could not have been used in laying the cement on the fourth to the seventh floors without you having seen them, but it is possible, isn't it, that troughs might have been used for parts of those floors without you having seen them?

A. He might have used them for part of it. Yes, he might have done it but I never did see him use any troughs.

X Q. 51. In the construction of the tower and the mounting of the hopper, what is your recollection as to the scheme of extending that up? Was the hopper adjustable and would it move upwardly?

A. Yes, the hopper was molded on to the tower and you would have to have the hopper up to use that spout. You would have to have the hopper something like 20 feet above the floor.

X Q. 52. It would have been an easy matter to move this hopper upwardly enough to enable you to use the spout?

[fol. 53] A. Well, a man might have moved it up but it would take quite a time to move it. It would take a half day to move that and lower it.

X Q. 53. You mean even if the tower was already built?

A. Yes, the tower was already built, but when you move up your hopper you have to take your bolts all out, raise that up and then lower it back.

X Q. 54. What has been your work since 1906? Have you been interested in concrete construction?

A. Yes, sir.

X Q. 55. You have been on a good many other jobs since that time?

A. I have been on a good many jobs since that time.

X Q. 56. What enables you to recall the facts in connection with this particular Lynnhaven Hotel job; way back in 1906?

A. Well, by being asked, you know, being on the job and a man would come and ask me, you know. We were all interested in concrete work at the time, you know, and anything new, any new system in handling concrete, we were interested in it and we would try to catch on to it.

X Q. 57. That particular Lynnhaven Hotel job was only one of a large number that you were interested in at that time?

A. Yes.

X Q. 58. Did you know a man by the name of R. B. Preston who was connected with it?

A. Yes, I know Mr. Preston.

X Q. 59. Was he employed in connection with the Lynnhaven Hotel?

[fol. 54] A. I think he was their superintendent on the job for a while. Yes, I know he was. I don't remember exactly how long he was there.

X Q. 60. Did you know a son of Mr. E. Tatterson, a man by the name of Townley Tatterson?

A. Yes, sir.

X Q. 61. What was his capacity in connection with the Lynnhaven Hotel work?

A. I don't know. I don't know what he did in the Lynnhaven Hotel. He kept time for me for a month or two on the Fairfax Hotel.

X Q. 62. Was that before or after the construction of the Lynnhaven Hotel?

A. During the construction of the Lynnhaven Hotel that he kept time for me and he left there and went to school, when he went off to school that fall.

Redirect examination by Mr. Anderson:

R. D. Q. 63. Was Tatterson keeping time for you on the Fairfax Building when he left to go off to school, do you remember?

A. I don't think he was. I don't remember, but Townley kept time for me and came home from school that spring. His father told me to take him and see if I could make him work and keep time. I worried with him for a good while and couldn't do much with him, so I told him I would keep the time myself rather than fool about it. I used to have to hunt him up every time I would want anything and it took about a half hour to find him.

R. D. Q. 64. I didn't ask you a while ago, Mr. Baker, when I showed you this Exhibit 20 whether or not you were familiar with drawings? Are you familiar with drawings?

[fol. 55] A. Yes, sir.

R. D. Q. 65. And have no difficulty in reading them?

A. Yes, sir, I have been reading drawings for the last twenty-five or thirty years.

R. D. Q. 66. Mr. Smith has testified that during part of the time he used as many as three of these troughs, two of which are shown here and are marked 4 and 5, and, as I remember it, it has been testified that these troughs were from 10 to 14 feet in length which would mean that if they were used the radius of the area around the mouth of the hopper would be about 30 feet. Do you think it would have been possible for Mr. Smith to have used a trough for laying that much concrete on the floors four to seven without your having seen it?

A. No, I don't hardly think it would.

R. D. Q. 67. I show you a pencil sketch which is attached to an affidavit of Andrew J. Kerns, made by him in this case, which was executed the 23rd day of August, 1920, and will ask you to state how the construction of the hopper shown in this drawing at 3 compares with the hopper which was used during the construction of the Lynnhaven Hotel, just in general appearance?

A. That looks something like the hoppers we use on all buildings. That is practically the same thing. He has a wheel barrow drawn to run under that. That is just about like the ones we used on all

the jobs that we were doing at the time. He used such an arrangement.

R. D. Q. 68. Was that a wooden hopper or what kind of a hopper?

A. A wooden hopper, yes, sir. This hopper that was fastened on to the tower was a wooden hopper and the automatic dumper was [fol. 56] metal or sheet iron. That is the one that conveyed from the mixer to this hopper. It was a metal bucket and this was a wooden hopper.

R. D. Q. 69. And that metal bucket automatically dumped out into the hopper; is that so?

A. Yes.

R. D. Q. 70. Did they use a door similar to this door 4 here for permitting the concrete to be discharged from the hopper.

A. Yes, sir, he had a door here and a man here to handle that door with a lever, to raise that up and dump a wheel barrow full and cut the concrete out there.

R. D. Q. 71. Was there some man standing there to operate that lever?

A. A man to operate that lever.

R. D. Q. 72. You mean the lever 5?

A. Yes, this lever here that operates this door. There was a man there to operate that lever to dump the concrete into the wheel barrows.

R. D. Q. 73. And according to your recollection then that is a substantially correct rough drawing of what was used on that building?

A. It is my recollection that was what was used every time I was on the job.

Mr. Anderson: The Notary is requested to mark the sketch referred to by the witness for identification Plaintiffs' Exhibit Kemo' Sketch.

Signature waived by agreement of counsel.

WALTER NEWSOM THORNTON, being first duly sworn, testified on behalf of the plaintiffs as follows:

Examined by Mr. Anderson:

[fol. 57] Q. 1. What is your name, age, residence and occupation?

A. Walter Newsom Thornton; age 52; residence, Norfolk, Virginia; occupation, plumbing and heating engineer.

Q. 2. How long have you been engaged in that business, Mr. Thornton?

A. As near as I can remember, about thirty some years, I guess.

Q. 3. Did you have anything to do with the construction of the Lynnhaven Hotel?

A. Yes, sir.

Q. 4. Just what?

A. Just the plumbing.

Q. 5. Do you know who was the contractor for that building?

A. Mr. Tatterson, E. Tatterson.

Q. 6. Do you remember who was the superintendent or foreman in charge of the work on the building?

A. To my remembrance it was Mr. Baker, general superintendent, as near as I can come to it.

Q. 7. He was the general superintendent for Mr. Tatterson?

A. He was looking after all the buildings, if that is what you have reference to.

Q. 8. Who had charge of that particular building?

A. Mr. Smith. I don't know his initials.

Q. 9. Do you remember when that building was constructed?

A. It was just before the exposition, as near as I can come to it.

Q. 10. And that was when? 1907?

A. When was the exposition? I don't know.

[fol. 58] Q. 11. 1907?

A. 1907, I believe.

Q. 12. To what extent did your work require you to visit the building?

A. It required me every day because I had probably six or seven men or maybe more working on the building and, furthermore, it required my attention in regard to the pipes coming through the floors as they were pouring concrete. I had to see the men put boxes in, little forms to take care of my work to pass up through without cutting the concrete.

Q. 13. Does that mean that you got right up on the different floors of the building as they were being constructed?

A. Yes, sir.

Q. 14. And were all the floors made of concrete?

A. Yes, sir.

Q. 15. Do you remember how that concrete was distributed to the different floors?

A. I think so, yes, sir.

Q. 16. What is your recollection as to that now?

A. My recollection is it was distributed in wheel barrows.

Q. 17. From what point was it carried in wheel barrows?

A. From a shaft that was put up on the north side or on Freemason Street, the north side of the building. It was brought up in an elevator and dumped into a chute or dumped into a hopper, rather, and the hopper had a mouth to it and they brought the wheel barrow under the mouth of this hopper and they would open a little slide and it would fill the wheel barrow and they would shut it off.

[fol. 59] Q. 18. From that point the men pushed the wheel barrow to wherever they wanted to deposit the concrete; is that right?

A. Yes.

Q. 19. Did you see them doing that?

A. Yes, sir.

Q. 20. Did you ever see them distributing the concrete in any other way on that building?

A. No, sir, I did not.

Q. 21. Were you working in connection with that building from the time it started until it was finished?

A. Yes, sir, from the foundation up to the finished roof, finished inside.

Q. 22. And as I understand, you had charge of the plumbing?

A. Plumbing end of it, yes, sir.

Q. 23. What is your recollection as to the time of year the concrete was poured on the different floors of that building?

A. Our summers and winters are so much alike, if I had known that question was going to be asked me I might have given it more thought. That question has never been asked me before in regard to what I have already made a statement, but it strikes me it was during—somewhere around March, I guess. I give that up. I don't know. I rather think it was in March.

Q. 24. Are you familiar with the reading of drawings?

A. I think so, yes, sir.

Q. 25. Mr. Smith has testified that during the construction of the floors from the fourth to the seventh of this building that he [fol. 60] used troughs or chutes such as are shown in this drawing, Defendants' Exhibit 20, and will ask you if you remember ever seeing anything like that used for the distribution of concrete during the construction of this building?

A. No, sir, not at all.

Q. 26. If such troughs or chutes were used they would have covered an area of approximately 30 feet radius, using the mouth of the hopper as a center. Do you think it would have been possible to have used a trough like this for depositing that much concrete on these floors four to seven without you having seen it?

A. It would look so, yes, sir, that it would be impossible for them to use it without my seeing something similar to that. I would have seen it because I was on the floors every day.

Q. 27. I show you another drawing or sketch here which is marked Plaintiffs' Exhibit Kerns' Sketch, and I will ask you how the hopper which is shown in this drawing compares with the general shape and appearance of the hopper which was employed during the construction of that building?

A. That looks very much like the construction of the hopper and elevator. It looks very much like it. It was something similar to that, very much.

Q. 28. Where was the concrete mixed that was used on these floors?

A. It was mixed at the foot of the elevator.

Q. 29. That was on Freemason Street?

A. Yes, sir.

Q. 30. And then it was carried up in a bucket and discharged in the hopper; is that right?

A. Yes, sir.

[fol. 61] Q. 31. And then from the hopper into the wheel barrows; is that right?

A. Into the wheel barrows, yes, sir.

Q. 32. And what is your recollection as to the height of this hopper above the floor where the concrete was being laid, I suppose you would call it?

A. Do you mean from the floor that it was being poured on to the height of the elevator or chute?

Q. 33. No, I mean how high was the hopper, the mouth of the hopper above the floor that was being poured?

A. I judge probably about three feet, as near as I can remember it, just so a wheel barrow could go under there.

Q. 34. What is your recollection as to the height that this tower or frame went up above the level of the floor that was being poured?

A. I should say in the neighborhood of 10 or 12 feet, as near as I can remember.

Cross-examination by Mr. Smith:

X Q. 35. At the time that the Lynnhaven Hotel was constructed were you engaged on plumbing work in other buildings?

A. Yes, sir.

X Q. 36. Were these reinforced concrete buildings?

A. Yes, sir.

X Q. 37. Did you go around from one building to another at that time?

A. Yes, sir.

X Q. 38. About how often do you suppose you visited the Lynnhaven Hotel Building?

[fol. 62] A. I visited the Lynnhaven every day.

X Q. 39. What was the practice at that time with reference to the location of the pipes that you were putting in? Were they grouped together in some part of the building?

A. They were all over the building, all around.

X Q. 40. Distributed around in the walls?

A. Yes, sir.

X Q. 41. What was your duty when you went down there?

A. To see that all the places had boxes put in or forms, as we call them, so our pipes would go through and they wouldn't pour concrete in those places so when they take the boards from underneath we would have a free hole to go through without cutting the concrete because nine times out of ten they would always put the iron right where the holes come and we always had to make provision for our pipes to run up as straight as we possibly could.

X Q. 42. Were these boxes made and installed by you?

A. By my men, yes, sir.

X Q. 43. Your men could make these boxes and install them without your being there?

A. Nine times out of ten I would lay them off because sometimes they would get them a little bit out of plumb or something of that kind and I would take the plans and go over the plans and put them down as they would be pouring the concrete and get them straight on that score before I would go away from the building.

X Q. 44. Did you do all of that work personally or did some of your men do it?

A. My men did most of the work. I was superintending it, looking after it, and I would probably make a couple of visits there during the day.

[fol. 63] X Q. 45. You weren't actually present all the time when these boxes were being located and the cement being poured?

A. Well, I would generally stay around. When they would pour a floor I would generally look after the floor particularly because when they would pour it on one floor today they wouldn't pour it on the other work. It would have to stand and wait some time.

X Q. 46. Do I understand that is your general practice or is that what you did at that time in 1906?

A. In all the buildings that Mr. Tatterson was building, that were being constructed pretty much at the same time, he would take a force of men off of one job, as near as I can remember, and carry them to the other when they got ready to pour the floors.

X Q. 47. When you were on the job at this Lynnhaven Hotel Building you were located at the place where the cement was being laid and not at the place where it was being elevated from the ground?

A. Of course, I would be first probably up on the building on the roof and then I would be downstairs, back and forth, because I had men working all over the building from top to bottom. They were working all over it.

X Q. 48. During the past 15 years have you been engaged in plumbing business?

A. I have been engaged in the plumbing business for the last 30 years.

X Q. 49. Has anything happened during the last 15 years to refresh your memory, particularly about the Lynnhaven Hotel work?

A. No, nothing to refresh it that I know of.

X Q. 50. How are you able to recall particularly what happened on that particular job?

[fol. 64] A. There ain't but one thing that I have known particularly that happened and that is one of the floors gave way where the concrete had just been poured on it and it broke through. That is about the only thing that I know of.

X Q. 51. Do you remember anything about the consistency of the cement that was used there? Was it in a liquid condition so it would flow freely?

A. Well, I suppose to pour concrete it would have to be in kind of a liquid state in a way, soft so it would be easily distributed over the floor.

X Q. 52. What experience have you had in reading drawings?

A. Well, I have been doing it for the last 35 years.

X Q. 53. When you were asked by Mr. Anderson you said "I think I can."

A. I wouldn't like to say that I know all about it but I don't think there is anybody that would——

X Q. 54. I hand you this drawing, which is Defendant's Exhibit

20, of the Lynnhaven Hotel apparatus, and I ask you to explain what you understand to be shown there?

A. Well, of course, this being the elevator, what I would term to be an elevator. This is what brings up the concrete. When it gets up to this point here it is dumped into this box, trough or anything you want to call it on a sketch of this kind. He brought it in this way and would chute it back that way or this thing could be turned around and chute this way instead of chuting it straight out. I don't know what else you want me to explain about this, this being a rope down here holding this part of the box or chute or whatever you may term it.

[fol. 65] X Q. 55. That is all right. I just wanted to see whether you understand it or not. You say that you were on the Lynnhaven Hotel job all the time from start to finish; that is you were there supervising the work at intervals?

A. Yes, sir. I don't think I missed a day excepting Sundays.

Redirect examination by Mr. Anderson:

R. D. Q. 56. At the time this Lynnhaven Hotel Building was constructed had you had any previous connection or work with buildings constructed of concrete?

A. Yes, sir.

R. D. Q. 57. Where you at that time familiar with the consistency of the concrete as used in pouring it on the different floors or foundations?

A. You mean the quanty that was mixed, sand and cement?

R. D. Q. 58. I mean as to its liquid condition?

A. Yes, sir.

R. D. Q. 59. You were familiar with it at that time?

A. I only know they made a soft mixture so it would be distributed easily and when they would pour it it would seek its own level.

R. D. Q. 60. Did you notice any difference between the concrete which was used by Mr. Smith on the Lynnhaven Building and the concrete which was used on other buildings?

A. No, sir.

R. D. Q. 61. No difference whatever?

A. I didn't see any, no, sir.

R. D. Q. 62. The same consistency?

[fol. 66] A. Yes, sir. I couldn't tell what ingredients he put into it or anything of that kind.

R. D. Q. 63. Do you know Andrew J. Kerns?

A. Yes, sir.

R. D. Q. 64. How long have you known him?

A. I couldn't say particularly. I knew him before he went to the Lynnhaven Hotel.

R. D. Q. 65. Was he employed on the Lynnhaven Hotel Building?

A. Yes, sir.

R. D. Q. 66. What is your recollection as to the length of time he was on that building?

A. I wouldn't like to say but it strikes me that he was there the whole time.

R. D. Q. 67. Do you happen to recall what he did about the building there?

A. Yes, sir. I think he looked after the man who poured the concrete.

R. D. Q. 68. Did you see him on the building?

A. Yes, sir.

R. D. Q. 69. And that is your recollection?

A. That is my recollection, yes, sir.

Recross-examination by Mr. Smith:

R. X Q. 70. Do you remember any other men who were on the job there?

A. Yes, sir.

R. X Q. 71. Do you remember Mr. Arthur L. Smith?

A. Yes, sir.

R. X Q. 72. What was his position?

A. He seemed to be foreman, what we would call foreman of the construction.

[fol. 67] R. X Q. 73. He was in charge of the concrete construction?

A. I don't know whether you would call it that. He was in charge of the whole building in a way.

R. X Q. 74. Do you know a man by the name of R. B. Preston?

A. I don't say I do.

R. X Q. 75. You couldn't remember whether there was any such man connected with the Lynnhaven Hotel job?

A. No, sir, I do not.

R. X Q. 76. Did you know a man by the name of Townley A. Tatterson?

A. I know Mr. Tatterson, yes sir.

R. X Q. 77. Do you remember whether he was connected with the Lynnhaven Hotel job?

A. It was seldom I ever seen him around. He might have been but it was very seldom I ever seen him.

R. X Q. 78. You are quite positive that you never saw any troughs or chutes used for distributing cement there?

A. I am positive I never saw them.

Signature waived by agreement of counsel.

Roland Brinkley, being first duly sworn, testified on behalf of the plaintiffs as follows:

Examined by Mr. Anderson:

Q. 1. State your name, age, residence and occupation?

A. Roland Brinkley; age 43; contractor, Norfolk, Virginia.

Q. 2. With what firm or company are you connected, Mr. Brinkley?

A. Baker-Brinkley Company.

[fol. 68] Q. 3. How long have you and Mr. Baker been in business together?

A. About twelve years, I think, or something like that.

Q. 4. What was your business prior to the time that you and Mr. Baker went in business together?

A. The same line of business, contracting with Mr. Abrams.

Q. 5. Were you ever in the employ of Mr. E. Tatterson?

A. Yes, sir.

Q. 6. Do you remember when the Lynnhaven Hotel Building was constructed?

A. Yes, sir.

Q. 7. Were you in his employ at that time?

A. Yes, sir.

Q. 8. In what capacity?

A. Office manager.

Q. 9. Did you have anything to do with time?

A. No sir, only figuring it in the office. You mean keeping it?

Q. 10. Yes, keeping time?

A. No.

Q. 11. You kept charge of it in the office, did you not? The time?

A. Figured it out, yes, sir.

Q. 12. During the time this building was under construction did you have occasion to visit it at any time?

A. Oh, yes, occasionally I would go up there.

Q. 13. How often would you say?

A. I should say about once a week.

[fol.'69] Q. 14. Were you ever up on the different floors of the building during the construction?

A. No, I don't think so.

Q. 15. You were not?

A. I had no occasion to go up on the upper floors.

Q. 16. Have you any knowledge as to the manner in which the concrete which was used in the construction of this building was distributed?

A. No, I can't say that I have. Of course, when I was going up there there was a hoist and whether it was distributed in spouts or wheel barrows, I couldn't possibly say.

Q. 17. You don't know?

A. I don't know. It wasn't my business to know.

Q. 18. Did you at that time hear anyone say anything about the use of spouts or troughs for the distribution of the concrete?

A. I did not.

Q. 19. Nobody mentioned it to you at that time?

A. No, sir.

(No cross-examination.)

Signature waived by agreement of counsel.

F. M. GLINES, being first duly sworn, testified on behalf of the plaintiffs as follows:

Examined by Mr. Anderson:

Q. 1. State your name, age, residence and occupation?
A. Fred M. Glines; age 41; residence, Tazewell Building, Norfolk, Virginia; occupation, structural engineer.
Q. 2. Where are you now employed, Mr. Glines?
A. Peebles & Ferguson, Architects.
[fol. 70] Q. 3. How long have you been in their employ?
A. Going on 21 years, I guess.
Q. 4. Do you remember when the Lynnhaven Hotel Building was constructed?
A. Well, it was beginning the latter part of 1906, completed along in 1907.
Q. 5. Who were the architects for that building?
A. John Kevan Peebles.
Q. 6. Did you have anything to do with the preparation of the drawings?
A. Well I had general superintendence of them all, practically, except the interior design.
Q. 7. How do you fix the date when the building was built?
A. From my recollection I knew that it had to be completed by the time the Exposition was opened and the dates on our drawings which are dated 1906.
Q. 8. Do you remember about when they were finished, those drawings?
A. You can't tell exactly when they were all finished because they were different months, but they were finished during June, July and August.
Q. 9. What, if anything, did you have to do in connection with this building during its construction?
A. I designed the reinforced concrete frame and naturally during the construction I would go on the job very nearly every day and go over it to see if they were carrying the steel out right and setting the steel and getting the proper thickness and proper sizes of the concrete members.
Q. 10. What is your recollection as to the manner in which the concrete was distributed to the different floors?
[fol. 71] A. Well, the concrete was distributed, from my recollection, in wheel barrows.
Q. 11. Do you recall whether or not any chutes or troughs were used for distributing it from the hopper to the different points on the floor?
A. Not in a general way. The reason that I remember particularly that wheel barrows were used on the floor, that is a flat slab construction, built between girders, not the up-to-date slab construction. Of course, that necessarily had the forming all flat with depressions for the girders. On top of that wood forming the electricians come along and put their conduits before they poured the

concrete. By wheeling these wheel barrows over it they would knock these conduits out of position all the time and the electricians were up in the air, you might say, for misplacing the conduits. They would have the conduits around on the floor and probably wire nails turned over to hold them in position and the wheel barrows would slip off the planking and knock the conduits all out of place and—I don't call it a spout. I call it a trough right next to the elevator where the bucket comes up. They had a hopper built out there, a bucket, and in the building they would use, where they couldn't get the wheel barrows around, a trough to go around that end.

Q. 12. You mean immediately around the discharge end of the hopper?

A. Yes.

Q. 13. Almost underneath it?

A. Very near underneath it, within a space of where they were closing up.

Q. 14. I show you a pencil sketch marked for identification Plaintiffs' Exhibit Kerns' Sketch and will ask you how the construction [fol. 72] of the hopper as actually employed on this building compared with the construction of the hopper which is indicated in this sketch?

A. That is practically about what they had. Of course, I couldn't go into the construction of it and size of the members but that is just about what they had. This is what I call a hopper hanging over the side here.

Q. 15. 3; is that what you mean?

A. Yes.

Q. 16. About how high from the floor was the mouth of the hopper? About how high from the floor was the lower side or lower end of the hopper?

A. Well, I should say that probably was about four feet.

Q. 17. Just high enough for the wheel barrows to get conveniently underneath?

A. Yes. You see this whole arrangement (pointing to side elevation marked "A")—at any time during the construction as they got from floor to floor, the very topmost height here wasn't more than 9 or 10 feet. In other words, this would probably be up about one story high all the time.

Q. 18. That is, you mean that the frame or tower or elevator in which the hoist bucket was elevated extended about 10 feet above the floor level of the floor which was being constructed?

A. Yes, sir, never any higher than that unless they would have a gang of workmen going along here probably beginning on the next floor, in the construction of the tower, but they wouldn't begin that until they had their forming all up a story higher.

[fol. 73] Q. 19. I show you another sketch or drawing marked Defendants' Exhibit 20 and will ask you if you have any recollection of ever having seen a structure such as is shown in that drawing employed for the distribution of the concrete on the Lynnhaven Hotel Building?

A. No, sir, I never did.

Q. 20. Did you know Mr. Arthur L. Smith who was foreman on that building?

A. I knew of him as coming down as foreman for Mr. Tatterson.

Q. 21. Do you remember seeing him on your different visits to this building?

A. Yes, I saw him on that building and the building across the street, the Main Line Realty Company Building. He also started putting that up at the same time this construction was going on.

Q. 22. Is that known as the Vinery Building?

A. The Vinery Building, yes, sir.

Q. 23. For the sake of the record, will you please state what you understand this drawing, Defendants' Exhibit 20, to be?

A. Well, I understand that to be a tower. There are no dimensions shown on it. It is a tower and troughs. That tower, in my estimation, would have to be, according to this sketch, about 25 or 30 feet above that floor and I don't have any recollection of seeing anything on the job of that character at all.

Q. 24. Supose the elevator tower extends only about 10 feet above the floor level of the floor on which the concrete was being poured, could you use troughs of that kind for chuting out the conrete for a distance of 20 to 30 feet?

[fol. 74] A. You couldn't possibly do that because your troughs would have to be underneath your hopper and that wouldn't give you any slope from the bottom of the hopper to the top of your pouring?

Q. 25. And you don't recall ever having seen the hopper situated more than about 3 or 4 feet above the floor level?

A. No, sir, the bottom part of it.

Q. 26. Have you any distinct recollection of having seen the men rolling their wheel barrows underneath the hopper and receiving from it the concrete and then pushing them off to the different points where it was to be poured?

A. Yes, that was the general arrangement that they had up there. One negro right after another would go with a wheel barrow up to the hopper and get concrete. As I say, my recollection is they went off on planks to the different places where it was disposed.

Q. 27. Mr. Smith has testified that this arrangement as shown in Defendants' Exhibit 20 was employed from the fourth to the seventh floors of the Lynnhaven Building, which would mean that the concrete was poured thereby over a radius of about 20 to 30 feet from the mouth of the hopper as a center. Do you think it would have been possible for him to have employed that apparatus that extensively without your having noticed it?

A. If he had had an apparatus out there I certainly would have noticed it because it would have been something new at that time.

Q. 28. I believe chutes or pipes are now employed for the distribution of concrete to rather a large extent in the construction of concrete buildings, are they not?

[fol. 75] A. They are now, yes, sir.

Q. 29. Do you remember about how long ago it was that such chutes came into use, within your knowledge?

A. Well, of course, at different times. You take, probably, for instance, when this building was going on and a little later I would see illustrations of chutes used.

Q. 30. I mean since you have seen them?

A. It hasn't been up to about four or five years ago that I have seen them in actual use.

Cross-examination by Mr. Smith:

X. Q. 31. How often did you visit the Lynnhaven Hotel when it was being constructed?

A. Probably when they first began putting up the forming and pouring the concrete I was probably there every day and some days probably twice.

X Q. 32. And during all the time the concrete was being poured?

A. Not continuously, you understand. I might be up there—yes, every day from the first floor to the roof. As I said before, this is about the second reinforced concrete building that we had built, this one here that we are in first and the building up in Roanoke was the second and the Lynnhaven and Vinery come in for about the third and fourth and, of course, I was interested in them and watching them very closely.

X Q. 33. What was your purpose in going around?

A. I designed the construction and I wanted to see if it was being carried out properly. Then, of course, all the work was new to all of us and we watched it going along. I wasn't employed as superintendent on the job although I had a right to go on and correct things if I found they weren't doing it properly.

[fol. 76] X Q. 34. Did you always go up to the top floor that was under construction or merely go around and look things over generally?

A. I would go around and look things over generally. Of course, I was on every floor as they went up. Take, for instance, when they are building a building like that and getting out the plans, after the building is up and construction going on, they will want to make different changes, take out a member here and there and I would have to go up and look matters over like that.

X Q. 35. Your duties didn't require you to go up and actually look at the cement being poured or distributed?

A. Well, my duties went as far as I wanted to take adavantage of them. If I wanted to leave the office and go up there and look at it, I had a right to do so.

X Q. 36. Do you recall how the tower and hopper were construted on that building?

A. Constructed out of wood and braced. The bucket, I think, was a metal bucket, probably put together with sheet iron and rivets and all the other parts were wood, bolted, probably, or spiked.

X Q. 37. You don't recall how the hopper was bolted in the tower?

A. I don't think the hopper was mounted in the tower at all. It was mounted on the outside.

X Q. 38. On the side, of course. You said on direct examination that some form of trough or chute was used in a certain part of the construction. Do you recall just what that construction was?

A. Well, it was a wooden trough used in a radius from the concrete mixer perhaps from 16 to 18 feet, used in closing up the concrete at the elevator.

[fol. 77] X Q. 39. You don't recall whether there were any other troughs used?

A. No sir.

X Q. 40. You never saw more than one trough extended out from the hopper?

A. No. Of course, I call that a trough but a trough like they are spoken of now in these days means a trough that is put up in sections, hung up 25 or 30 feet in the air, probably. It all depends on the distance they are going with the trough.

X Q. 41. We are talking about the particular thing that you saw over there?

A. This trough up there wasn't any more than two sections but they weren't troughing any more than 16 or 18 feet.

X Q. 42. Do you recall how the trough was supported?

A. Well, they probably had it blocked up. It was blocked up at the hopper.

X Q. 43. What do you mean by "blocked up"?

A. Put on horses or blocks, nailed together, two legs on a block.

X Q. 44. Do you recall whether it was suspended at all by a cable or anything of that sort?

A. No, it was just laid on supports on the floor. After they got to pouring the concrete toward the elevator, of course the niggers would hold the end of it themselves.

Redirect examination by Mr. Anderson:

R. D. Q. 45. Did you have anything to do with the Vinery Building?

A. What I did at the Vinery Building was practically the same as at the Lynnhaven Hotel.

[fol. 78] R. D. Q. 46. Do you remember the use of troughs or chutes such as are shown in Exhibit 20 being used on that building?

A. No, sir, I do not.

Signature waived by agreement of counsel.

CARTER GAY (col.), being first duly sworn, testified on behalf of the plaintiffs as follows:

Examined by Mr. Anderson:

Q. 1. State your name, age, residence and occupation?

A. Carter Gay; age 61; Norfolk, Virginia; occupation, drayman.

Q. 2. Did you ever work on the Lynnhaven Hotel Building?

A. Yes, sir.

Q. 3. What did you do there?

A. I was kind of a foreman over the hod carriers and concrete and so on like that.

Q. 4. Was that a concrete building?

A. Yes, sir.

Q. 5. What did you have to do with the pouring or spreading of the concrete?

A. I was around there and seen that it was done and seen that the work was carried on.

Q. 6. Were you there when they began working on the building?

A. Yes, sir.

Q. 7. Did you continue to work on the building until they finished the concrete work?

A. Yes, sir.

[fol. 79] Q. 8. Can you tell us just how the concrete was handled, just how it was handled on the building?

A. That was handled in wheel barrows that come up to the hopper and then poured out into the wheel barrows and the wheel barrows carried it around where it had to be dumped at until they got up so close where they would come up there and then they would take it and pull it around to different places with shovels and all such things as that.

Q. 9. You mean right around near the mouth of the hopper?

A. That is right, sir.

Q. 10. Was this concrete mixed down at the bottom of the tower or hoist?

A. Yes, sir, down at the bottom.

Q. 11. And carried up to the top in buckets?

A. Yes, sir.

Q. 12. And then it was dumped from the bucket into the hopper?

A. Yes, sir.

Q. 13. Just what work did you do? Tell up as nearly as you can just what work you did on the different floors?

A. On the different floors I stayed around there and assisted them around and sometimes when a man would be out I would catch hold of a wheel barrow and carry it around myself. I didn't have special work like that. I was kind of overseeing the work among the hod carriers.

Q. 14. You saw just what the men did?

A. I saw just what the men did.

Q. 15. You say you were on that job until they finished pouring the concrete?

A. Yes, sir.

[fol. 80] Q. 16. From the top to the bottom floor?

A. Yes, sir.

Q. 17. Did you ever see them using these troughs or chutes for pouring that hot concrete on that building?

A. Chutes?

Q. 18. Troughs or chutes?

A. No, sir, there weren't none used.

Q. 19. Then it is your recollection that all of the concrete around on the different floors except that right at the hopper was hauled around by wheel barrows?

A. It is certainly so, yes, sir.

Q. 20. Do you remember whether that building was put up before or after the Jamestown Exposition?

A. Well, that kind of slipped my recollection about that. I don't know exactly what year that was.

Q. 21. Not about the year; was it before or after the Exposition?

A. It was before.

Q. 22. Do you remember the name of the superintendent or foreman on that building, the general foreman?

A. Smith, I believe his name was. I think his name is Smith.

Q. 23. You never saw him using any troughs or chutes for pouring the concrete, did you?

A. No, sir.

Cross-examination by Mr. Smith:

X Q. 24. How do you happen to know that this building was put up before the Exposition? How do you remember the date?

A. I can't remember the date but then I think it was before the exhibition. I know it was.

[fol. 81] X Q. 25. What have you been doing since that time?

A. Well, I carried bed a good bit and worked around for different contractors here and there and then I went to draying just as I am now, after that.

X Q. 26. Have you worked on any other concrete buildings since?

A. Oh, yes, sir, worked on several of them.

X Q. 27. How do you happen to remember what was done when they put up that hotel?

A. Well, because I hadn't worked no other way except with wheel barrows at that time. There wasn't no chutes and things then as I know anything about. I quit working around with contractors when the chutes come around.

X Q. 28. Was that the first concrete job you worked on?

A. No, sir, it wasn't the first one I worked on.

X Q. 29. When you were around that job there were you always on the floor when the cement was being poured and laid?

A. Yes, sir, principally always on the floor.

X Q. 30. Were any other men there who had jobs like you had?

A. No, sir, didn't any other one have exactly the job I had because I was kind of foreman in the work and waiting on the different men, you know, and the rest of them had certain work, was assigned to a wheel barrow and when their turn come they had to take their wheel barrow and go on off, and if any man was out I would catch his wheel barrow at the same time.

X Q. 31. How long did you work there on that hotel job?

A. I worked there—well, I guess it was over a year before it was completed before I left there.

[fol. 82] X Q. 32. Were you there when they first begun to lay the cement?

A. Yes, sir.

X Q. 33. You don't remember what happened on any particular floors of the building? Do you remember whether they used the same scheme for distributing the cement on every floor?

A. On every floor.

X Q. 34. Do you remember anything about the construction of the tower and the hopper for elevating the cement?

A. No, I didn't know anything about it no more than I just knowed it was there. Of course, I didn't have to work in that none to amount to anything. I just know it was there. I know about that.

X Q. 35. You were around on the floor where the wheel barrows were used, were you?

A. Yes, sir.

X Q. 36. When was this thing first brought to your mind, this matter of the construction of the hotel building?

A. When was it brought to my mind?

X Q. 37. Yes.

A. I just heard of it today.

X Q. 38. You just heard of it today?

A. Yes, sir.

X Q. 39. Who called your attention to it today?

A. Well, this Mr. Kerns was looking for me, I suppose. He happened to come across me and asked me and told me about it, told me about the Lynnhaven Hotel and asked me was I working there. He knowed that because I was working there the same time he was.

[fol. 83] X Q. 40. Did anybody suggest any of these things to you at all?

A. No, sir, just more than told me was I working at the Lynnhaven Hotel and that he knowed already.

X Q. 41. You don't remember seeing any chutes around there on the job?

A. No, sir, there weren't no chutes on that job.

X Q. 42. Were any chutes used at all even for a short time on that job?

A. No, sir, weren't no chutes used at all.

X Q. 43. You don't remember them at all?

A. No, sir.

Signature waived by agreement of counsel.

ANDREW J. KERNS, being first duly sworn, testified on behalf of the plaintiffs as follows:

Examined by Mr. Anderson:

Q. 1. State your name, age, residence and occupation?

A. Andrew J. Kerns; foreman, employed by H. K. Ferguson,

Cleveland, Ohio. My address is 3 East Cary Street, Richmond, Virginia; age 43.

Q. 2. What has been the character of your work with H. K. Ferguson?

A. General labor and concrete foreman.

Q. 3. Did you formerly work in Norfolk?

A. Yes, sir.

Q. 4. Were you employed in connection with the construction of the Lynnhaven Hotel?

A. Yes, sir.

Q. 5. Do you remember who contracted for that building?

[fol. 84] A. E. Tatterson.

Q. 6. Do you recall about when it was built?

A. It was started in the neighborhood of June, 1906.

Q. 7. About when was the construction work finished? I mean by that to exclude the furnishing and that sort of thing, putting it in condition to be occupied.

A. We finished pouring concrete in the neighborhood of December or January, 1907, but the building practically wasn't finished until, you might say—it was after March.

Q. 8. March, 1907?

A. Yes. I was taken off of there and put over on the Vinery when they were finishing pouring the roof.

Q. 9. Do you mean December, 1906, and January, 1907?

A. Yes, sir.

Q. 10. Did you start to work on this Lynnhaven Hotel Building at the time the work began?

A. Yes, yes, I started in there as fireman and engineer on the concrete mixer.

Q. 11. Where was that mixer located?

A. On Freemason Street about 100 yards from the corner of Granby.

Q. 12. Do you mean 100 yards or 100 feet?

A. 100 feet.

Q. 13. Go ahead and tell us in a general way from the very beginning what was the nature of your work on that building.

A. I went to Mr. Tatterson and told him I wanted a job to learn the concrete construction business and he told me I would have to start at the bottom. He had a man on the mixer and he couldn't keep steam so he put me over there. The mixer was down in the [fol. 85] ground and the hopper was level with the street, so I went over there and I succeeded in keeping steam and keeping the mixer going. Then he gave me charge of the two hoisting engines and the concrete mixer and from that I worked along and he put me up there then filing saws and from filing saws I got to learn how to read plans and Mr. Smith took me out and showed me how he wanted me to help him on the second floor, so I helped him at that time. On the fourth floor Mr. Metz was either discharged or left, I don't know which. He was a concrete foreman that came there. I was taken by Mr. Tatterson and by Mr. Smith and instructed to pour the concrete. He told me to bear in mind they wanted a

smooth job and a good solid job. Mr. Smith watched me all during my construction work and helped me out.

Q. 14. Were you made foreman of the concrete pouring part of the work?

A. Labor and concrete, yes, sir.

Q. 15. You refer to Mr. Smith. Do you mean Mr. Arthur L. Smith?

A. Arthur L. Smith, yes, sir.

Q. 16. What was his position in connection with that work?

A. Superintendent.

Q. 17. What is your recollection as to the date when you began working on the fourth floor or when you became concrete and labor foreman?

A. Somewhere in the neighborhood of July or August. I can't say positively which, that I was taken out and put out on that work. I had previously handled labor before; when I didn't have saws to file or such work as that I would go out and just assist them the best way I could and learn to handle the men.

[fol. 86] Q. 18. Do you think that you had reached as high as the fourth floor in this work by July or August?

A. I think it was along somewhere in the latter part of August or September that we had got in the neighborhood of the fourth floor.

Q. 19. Do you know Mr. R. B. Preston?

A. Yes, sir.

Q. 20. What did he have to do with that building, if you recall?

A. He was building inspector for the architect. He was to see that the steel was put in properly and that the concrete was placed properly.

Q. 21. Were you on the work there when he came on the job?

A. Yes, sir.

Q. 22. I don't suppose you remember about when he came, do you, or not?

A. I can't say positively that I can.

Q. 23. How long were you on that work? You started in at the beginning and how long were you on that job?

A. I was on and off of it practically until it was finished.

Q. 24. How was the concrete distributed or poured during the construction of this building?

A. By wheel barrows only.

Q. 25. Suppose you describe the operation, starting with the concrete down at the bottom of the tower and taking it right on up until it is distributed on the floor or in the forms on the floor, I guess you would call that?

A. The mixer was set in the ground, as I said before, and the mouth of the mixer had a lip which discharged into a bucket which [fol. 87] was set into a frame and the bucket lowered into a pit so that it would be below the mixer. By the aid of a cable and shieve wheel at the top of the tower, as far as it was built, we drawed the bucket up which discharged into a hopper which was closed at the end by a piece of steel called a gate, operated by hand, and when a man would come up with his wheel barrow and would go under

there he opened it and filled his wheel barrow and closed it and the man went to his destination with the concrete, and when he got in close range, that is where we couldn't handle the wheel barrow underneath the hopper, we would take up the platform, take down the stay prop and at times I did just take a long board and hold in front to help chute it back so we could save ourselves from pulling it so much, just take a plank and put it in that shape so it would hit and go underneath there (illustrating by a book) but no chutes were ever used at any time during my time on the job and I stayed there until I finished the roof and then I was sent over to the Vinery to dig out footers and pour the footers for the erection of the Vinery Building. Of course, if Mr. Smith wanted anything I would bring my laborers back to the Lynnhaven and finish what he wanted and go back again.

Q. 26. I show you Defendants' Exhibit 20 and will ask you if you recall ever having seen any such construction as is shown in that Exhibit employed in the distribution of the concrete on the Lynnhaven Hotel Building?

A. No, sir.

Q. 27. You referred a moment ago to the fact that the concrete was dumped from the hoist bucket into a hopper. How high was the bottom or mouth of this hopper from the floor which was being built at that time?

A. Three feet, just enough to let the wheel barrow come under.

[fol. 88] Q. 28. I show you a sketch which is marked Plaintiffs' Exhibit Kerns Sketch, which is attached to an affidavit heretofore executed by you on the 23rd day of August, 1920, and will ask you if that sketch was made under your direction?

A. Yes, sir, it was.

Q. 29. Does that sketch represent in a general way your idea of the appearance of the hopper with a wheel barrow under the outer end of the hopper as they were employed during the construction of this building?

A. It is.

Q. 30. Was that hopper of metal or wood construction?

A. Wood, lined with tin or light steel metal so the concrete would slip out.

Q. 31. What is your recollection as to the height to which the hoisting tower was extended above the floor on which the concrete was being poured? For instance, suppose you were pouring concrete on the fifth floor, how high above the fifth floor did the hoisting tower extend?

A. In the neighborhood of 20 or 25 feet.

Q. 32. Was that the case in the Lynnhaven Hotel construction?

A. Yes, sir.

Q. 33. If chutes and troughs were not employed during that construction why did they run the hopper so high above the floor on which you were distributing the concrete?

A. To give the bucket leeway to travel up to come underneath the shieve—the cathead that come across. The hopper wasn't that high.

Q. 34. Arthur L. Smith has testified that troughs or chutes were

used similar to what are shown in Defendants' Exhibit 20 from the [fol. 89] fourth to the seventh floors of the Lynnhaven Hotel Building, and also that there were at times as many as three lengths of troughs used, which would mean perhaps that an area of a radius of 20 to 30 feet and perhaps greater would have been poured or distributed by means of troughs. Do you think it would have been possible for such troughs or chutes to have been used to that extent without your seeing them?

A. No, sir.

Q. 35. Were you ever discharged by Mr. Tatterson during the period that you were employed on this building?

A. Not on the Lynnhaven, no, sir.

Q. 36. And you were in the employ of Mr. Tatterson and working on this building continuously from the time it started until the constructional part of the work was completed; is that correct?

A. Yes, sir, except when Mr. Smith wanted me for any such thing such as to take a gang of men and clean out a place and move a lot of lumber and such stuff as that, I would take my men over from the Vinery and finish and go back.

Q. 37. Then you went over to the Vinery, did you, after the pouring of the concrete was completed on this building?

A. Yes, sir.

Q. 38. And before what you might call the finishing up work was done on the Lynnhaven; is that right?

A. Yes, sir.

Q. 39. Do you remember who was time keeper on this building in the early part of the work, say, up to December, 1906?

A. Joe Bocre.

[fol. 90] Q. 40. Do you know Townley Tatterson?

A. Yes, sir.

Q. 41. Who is he?

A. He is the son of the contractor, E. Tatterson.

Q. 42. During this period that you have just mentioned was he employed on this building?

A. No, sir, he wasn't the early part of it.

Q. 43. I mean during the period up to say December, 1906?

A. No, sir.

Q. 44. Do you know anything about where he was employed in the summer of 1906 before he went off to college?

A. By Mr. Baker on the Fairfax and Paul-Gale-Greenwood Buildings.

Q. 45. Then he was not time keeper at any time during the summer or latter part of the summer of 1906?

A. No, sir.

Q. 46. Later on, say after the first of the year, 1907, beginning with February, do you know whether he was then employed on the Lynnhaven Building?

A. Yes, sir, he was employed there as time keeper.

Q. 47. Was that after he left college?

A. Yes, sir, after his father had wrote for him. Bocre had got in bad and that is when his father sent for him.

Q. 48. How do you fix the time at or during which this building was built?

A. 1906?

Q. 49. Yes.

A. The way I come to recollect it, I know it was 1906 I had previously been employed by the Norfolk & Western.

[fol. 91] Q. 50. Was it before or after the Jamestown Exposition?

A. It was before then.

Q. 51. Was there any special effort being made to finish this building so as to have it ready for the visitors to the Exposition?

A. Every possible means. We were working night and day.

Q. 52. Do you know Mr. William T. Baker?

A. Yes, sir.

Q. 53. Do you know whether or not he was employed by Mr. Tatterson at the same time you were, 1906 and 1907?

A. He had been with Tatterson some time before I came with him.

Q. 54. Was he in his employ in 1906 and 1907?

A. Yes, sir.

Q. 55. Do you know in what capacity, what he was doing?

A. He was general superintendent and he was building the Fairfax and Paul-Gale-Greenwood Building the same time we were building the Lynnhaven.

Q. 56. Do you recall ever having seen him on the Lynnhaven Building during the time it was being constructed?

A. Yes, sir, I was sent by Mr. Tatterson down here to the Fairfax to get him once and we had occasion there of the floor giving way, the fifth floor.

Q. 57. By the way, did you have some sort of an accident while that building was being constructed?

A. Yes, sir, I was coming up with cement when the fifth floor gave way and then I had an accident just along about Christmas time.

[fol. 92] Q. 58. 1906?

A. 1906, by sticking two nails through my right foot.

Q. 59. Where did that happen, on the building?

A. Yes, sir.

Q. 60. What floor, do you recall?

A. In the neighborhood of the third or fourth floor.

Q. 61. At the time that happened how far along were you with the pouring of the concrete?

A. Well, the roof was done but we wasn't through pouring the last floor, that is the stairway. We always kept that. We never say we are through pouring until we are finished up.

Q. 62. But the floors had all been poured at that time?

A. The floors had been poured, yes, sir, but the concrete tower wasn't down nor the hopper wasn't down nor we hadn't taken any of our concrete tools from up there because we were finishing pouring the steps, pent houses, elevator shafts, and so on.

Q. 67. That is your recollection that all of the concrete used in the construction of this building was discharged from the hopper into wheel barrows, with the exception of that right around under-

neath the hopper, and was hauled by wheel barrows to different points on the different floors where it was deposited; is that correct?

A. It was, sir.

Q. 64. You said a while ago that you were also employed in the construction of the Vinery Building after you had finished the concrete work on the Lynnhaven Building. How was the concrete distributed in this building?

A. The same as the Lynnhaven, with wheel barrows only.

[fol. 93] Q. 65. No chutes or troughs used for conveying it from the hopper to different places on the floor level?

A. No, sir.

Q. 66. Mr. Smith in his testimony stated that the pouring of the concrete was finished in about three and one-half months. What is your recollection as to the period during which the concrete was being poured on the Lynnhaven Building?

A. I can't say for sure, absolutely right, but it was somewhere in that neighborhood. It may have been a little bit longer, but in finishing out, that is, pouring all the concrete and putting in all the finishing to the roof, we was a good deal longer than that.

Q. 67. How about the floors?

A. The floors *was* in.

Q. 68. In about three and one-half months?

A. In about three and one-half months. I will say four months to be sure.

Q. 69. I show you Defendants' Exhibit 19 and call your attention to the part or parts marked 2 and 3. What do you understand those parts to be in that photograph?

A. Part 3 is the mouth of the hopper, the handle to the spout where we was discharging into wheel barrows.

Q. 70. And what is 2?

A. 2 is the top of the frame that goes across to hold the top of the hopper together under the strain of the concrete.

Q. 71. What does "P" represent? Is that a brace running up from the hopper to some part?

A. Known as stay braces from the top of the tower to the side of the hopper to hold the hopper in position.

[fol. 94] Q. 72. Do you see anything in this photograph that looks like any sort of a chute or trough leading from that hopper?

A. No, sir.

Q. 73. Do you know Mr. Walter Newsom Thornton?

A. Yes, sir.

Q. 74. Do you remember whether he had anything to do with the work on that building, on the Lynnhaven Building?

A. Yes, sir, he set in all the plugs for the steam fitting and plumbing, pipes coming through from one floor to the other, and he used to bawl me out continually about covering them up and he would have to come around and uncover them.

Q. 75. And Mr. J. Samuel Goldback—do you know him?

A. Yes, very well.

Q. 76. Do you remember whether or not he had anything to do with any of the work on this building?

A. Yes, sir, he put in the conduits for the electric wires, the pipe work, under the steel, and lots of times I would have to wait for him to finish to get a little piece of pipe.

Q. 77. Do you remember seeing him about the building during its construction?

A. Yes, sir.

Q. 78. Frequently or infrequently?

A. Very frequently. He would come up there and help the boys to work sometimes and did a lot of work himself.

Q. 79. Have you a distinct recollection of having seen the concrete [fol. 95] discharged from the hopper into the wheel barrows and the wheel barrows rolled or pushed from the hopper to the different points on the building where the concrete was dumped or deposited?

A. Very distinctly. I used to do it myself.

Q. 80. Do you recall having gone with me some time during last summer to call on Mr. Townley Tatterson?

A. Yes, sir.

Q. 81. You were with me at our interview?

A. Yes, sir.

Q. 82. Do you remember what Mr. Tatterson said at that time as to his recollection as to whether or not troughs or chutes were used in the construction of this building?

Mr. Smith: This question is objected to as calling for heresay.

A. He said he didn't remember of any chutes being used or he didn't remember much about the job, that there was very little that he was around there.

By Mr. Anderson:

Q. 83. You were present when he made that statement?

A. I was. He made it to me.

Cross-examination by Mr. Smith:

X Q. 84. Were you transferred from the Lynnhaven Hotel job as soon as the concrete was completed?

A. I was back and forth. I wasn't transferred. I wasn't taken away. I got my salary from the Lynnhaven job just the same.

X Q. 85. What did you do after the concrete work was finished? There was nothing else for you to do around there?

[fol. 96] A. I had separate gangs of men. I had men in the Lynnhaven cleaning up and things of that kind, taking old lumber out, and I had men on the Vinery digging out holes for the footers, cutting out holes around the pile caps.

X Q. 86. How long had these men worked on this cleaning up job after the cement was laid?

A. Well, they were practically there until the job was finished.

X Q. 87. When was that?

A. It was somewhere in the neighborhood of March or April. I can't say positively. We commenced moving in the furniture when

we had finished and it was painted but they had not finished the dining room and the main entrance and the rathskeller.

X Q. 88. How often were you transferred to the Vinery Building while the cement work was going on on the Lynnhaven Building?

A. Probably, Mr. Smith would be through with me sometimes in half a day on the Lynnhaven and he would say, "Kerns, take your men over and start on the footers again."

X Q. 89. What was the longest time you were ever on the Vinery Building during that time?

A. I think it was in the neighborhood of two months that I was on there and I was taken sick after we had finished the Lynnhaven. I mean by that we had practically finished, no more than going back and cleaning up.

X Q. 90. During the summer of 1906 while you were employed on the Lynnhaven Building you occasionally went over to the Vinery Building to work; is that correct?

A. Toward the last part of it, yes, sir, of 1906.

[fol. 97] X Q. 91. How long did you work over on the Vinery Building?

A. Probably wouldn't work over there a day before they would be ready for us on the next floor to go ahead.

X Q. 92. You shifted back and forth from one job to the other?

A. Yes, sir.

X Q. 93. Was Townley A. Tatterson employed as time keeper on the Lynnhaven Building while you were on that job?

A. He came there some time in January or February of 1907.

X Q. 94. That was after you had gone over to the Vinery Building?

A. Shifted backwards and forward, yes, sir.

X Q. 95. You were still on the Lynnhaven Building when he came there?

A. Yes, sir.

X Q. 96. How are you able to fix the date as January, 1907?

A. Because it was just at the time that I had come out after having my foot hurt and I come down to see Mr. Smith in regard to my salary. I hadn't received any and he told me that my salary had been ordered just the same. I went up then and saw the time keeper which was Joe Bocre. It was on Saturday and he told me that my money was down at the office. I went down there and I couldn't find it. I came back and met Townley and his father and I asked him about it and that is when we found out that the books was being padded. He had bricklayers and carpenters on there that wasn't on the job, amounting to the neighborhood of $250.00. Mr. Smith [fol. 98] came out and talked to me and said "Andy, I will fix it up for you, but I want you to hurry up and come back so you can put the concrete in the rathskeller." When I came back Bocre had been arrested that Saturday and I came there hobbling on one crutch and Townley then took up the job as time keeper.

X Q. 97. When was it that you were covered up by cement by the caving in of the fifth floor?

A. That was along in warm weather. I can't say just exactly when it was. It has been quite a while ago.

X Q. 98. Were you laid off after that?

A. Yes, sir, I never lost any time after that at all.

X Q. 99. When did you lose the two months. Was that after you stuck the nails in your foot?

A. Yes, sir.

X Q. 100. That was about Christmas time, 1906?

A. Yes, sir. I was going up to notify the men to knock off Christmas Eve, when it was done, in 1906.

X Q. 101. When was the concrete work begun on this Lynnhaven Building?

A. The foundation was started some time in June, 1906.

X Q. 102. I call you attention to a sketch attached to the affidavit heretofore filed in this case and executed by you on the 23rd day of August, 1920, and ask you who made this drawing?

A. Mr. Gleason, the superintendent, drew it for me.

By Mr. Anderson:

X Q. 103. Superintendent of what?

A. Superintendent of H. K. Ferguson Construction Company in building the Liggett & Myers Building in Richmond.

[fol. 99] By Mr. Smith:

X Q. 104. How did you happen to get him to make this sketch for you?

A. He was a little better drawer than I was. I just didn't know how to draw the way he did. That is all, and it was agreeable with Mr. Anderson to let him do it.

X Q. 105. What is Mr. Gleason's business now?

A. He was general superintendent for H. K. Ferguson.

X Q. 106. Is he engaged in concrete construction work?

A. Yes, sir.

X Q. 107. Is he familiar with apparatus of the kind illustrated in this sketch?

A. Yes, sir, he said so at that time.

X Q. 108. At the time he made this drawing?

A. Yes, sir.

X Q. 109. Did he say this is the kind of apparatus that is now being used?

A. No, sir, he did not.

X Q. 110. Was he on this Lynnhaven job at the time that was going on?

A. No, sir, he was not. I never knew there was such a man as him then.

X Q. 111. He had been on concrete construction jobs where this kind of an apparatus had been used?

A. Yes, sir. That is the old style way.

X Q. 112. Did he make this drawing without any help from you?

A. I just told him what I wanted and that is what he gave me.

X Q. 113. Did you indicate to him what you wanted?

A. The simple reason why there was one in Richmond being worked by the Ferrell Construction Company and I told him that [fol. 100] it was a chute, a hopper, the same as that one there that we used in Norfolk and I wanted to get an idea of it for Mr. Anderson.

X Q. 114. This apparatus that was in Richmond was there last summer when this sketch was made?

A. Yes, sir.

X Q. 115. And you told him to make a drawing of the apparatus that was in Richmond?

A. Yes, sir, some thing similar to it, yes, sir.

X Q. 116. This drawing then purports to show something that was down in Richmond last summer?

A. Not exactly. The hopper part wasn't built exactly that way. I explained to Mr. Gleason that it was more of a sloping shape.

X Q. 117. Is that handwriting on the drawing your handwriting or is that Mr. Gleason's handwriting?

A. I think Mr. Anderson put it on there.

X Q. 118. Did anybody suggest to you what you wanted to show on that drawing before you went to see Mr. Gleason?

A. No, sir, I told Mr. Anderson that there was no such thing as a chute used there and I told him I thought I could get him a drawing of something similar that we used and I asked Mr. Gleason would he help me and he said he would.

X Q. 119. Were you on the upper floor of this Lynnhaven Building at all times during its construction?

A. During the laying of the steel and pouring of the concrete I was, sir.

X Q. 120. That was not during the entire construction of the building, though, was it?

A. The fourth floor.

[fol. 101] X Q. 121. You didn't see any troughs used at all during any part of the construction?

A. No, sir.

X Q. 122. What education have you had, Mr. Kearns?

A. Common school education.

X Q. 123. Do you recall anything about the consistency of the cement that was used on the Lynnhaven Building? Was it soft enough or liquid enough to flow?

A. It was at one time when Mr. Preston ordered it stopped because it was too soft. After the sediment would come to the top and it made a scum, a very slippery scum on top.

X Q. 124. In the construction of reinforced concrete it is desirable to have the cement pretty wet, isn't it?

A. Well, according to the way you are going to use it or how you are going to use it. If you are pouring columns you don't want your cement too wet. If you are pouring floor slab you want it moist enough so it will give you a good surface underneath, but if you have it too wet the cement will go through the cracks. It will leave what they call honeycomb spots.

X Q. 125. Do you recall the nature of the steel reinforcement that was used in the Lynnhaven Building, just what was put into the cement there as a reinforcement?

A. Steel bars, caron bars made by Deitrich Brothers in Baltimore.

X Q. 126. Where is this Vinery Building located with respect to the streets?

A. It is about 125 feet from Freemason Street on Granby running through to Monticello.

X Q. 127. Near the Y. M. C. A. Building?

A. Second door from the Y. M. C. A.

[fol. 102] X Q. 128. There is one building in between?

A. Just a small building.

X Q. 129. How large is the Vinery Building?

A. I couldn't say now. I have forgotten. I used to know the full dimensions of it. It is in the neighborhood of two hundred and some feet deep but I wouldn't say for sure what the frontage is.

X Q. 130. Comparatively narrow building?

A. The Vinery?

X Q. 131. Yes.

A. No, the Vinery was a wide building.

X Q. 132. How high was the building?

A. Two stories, as far as we went.

X Q. 133. What kind of a hopper was used on the tower for receiving the cement from the buckets on the Lynnhaven Building. Was it wood or metal construction?

A. It was wood lined with sheet tin.

X Q. 134. Was this a hopper that was made up there on the job?

A. Yes, sir.

X Q. 135. How was it attached to the tower? How was it supported on the tower?

A. By way of bolts and braces nailed to it.

X Q. 136. Was it much of a job to take this hopper off and move it up when you moved the tower up?

A. Well, sir, we took it down and moved it in about three-quarters of an hour or an hour all told.

X Q. 137. You don't recall that any chutes or spouts were used for distributing cement at any point in the building?

A. Not at any point while I was on that job, no, sir.

Signature waived by agreement of counsel.

[fol. 103] The further taking of depositions in this matter was adjourned to 10 o'clock A. M., May 3, 1921.

Office of Phlegar & Tilghman

Norfolk, Virginia, May 3, 1921.

Met pursuant to adjournment of yesterday.
Present: Same parties as heretofore noted.

J. SAMUEL GOLDBACK, being first duly sworn, testified on behalf of the plaintiffs as follows:

Examined by Mr. Anderson:

Q. 1. State your name, age, residence and occupation?

A. J. Samuel Goldback; 34; Norfolk, Virginia; Atlantic Electric Company, vice-president and salesman.

Q. 2. How long have you been connected with the Atlantic Electric Company?

A. We were organized the 7th day of May, 1907, and have been in business continuously since then.

Q. 3. Prior to that time with what company were you connected?

A. Chesapeake Construction Company.

Q. 4. Is the Atlantic Electric Company a successor to the business of the Chesapeake Construction Company?

A. Consolidated and successor, yes, sir.

Q. 5. Did your concern, either the Chesapeake Construction Company or the Atlantic Electric Company, have anything to do with the construction of the Lynnhaven Hotel?

A. First the Chesapeake Construction Company and then the Atlantic after it was formed.

[fol. 104] Q. 6. Just what did these concerns have to do with the construction of this building?

A. The construction and installation of the electric equipment, so far as applied to lighting and power lines, installation of lighting and power lines.

Q. 7. Did you personally have anything to do with this work?

A. While the rough work was being done I was in charge of it.

Q. 8. Was the work which was done by your companies such as required your presence on the building during its construction?

A. Whenever we had work to do.

Q. 9. Just give us, if you will, some idea of just what the work was that your companies did?

A. Do you want to know how it progressed or what the class of work was?

Q. 10. Just so we can know whether you had to do with the setting of pipes up through the floors or what?

A. We had the setting of pipes in the forms of the building and the pulling in of the wires after the building was painted and the handing of fixtures.

Q. 11. You said a while ago that your work required your presence on the building during the period of the rough construction. Just what do you mean by the rough construction?

A. What we call rough construction, a building up to the time they start to plaster, start to put the finish on.

Q. 12. Of what construction is that building?

A. Concrete.

Q. 13. Were you on this building at times when they were pouring concrete?

[fol. 105] A. Yes, sir.

Q. 14. About how often would you say you were on the building during the time the concrete work was going on?

A. The number of times I couldn't say.

Q. 15. Was it frequently or infrequently?

A. I should say at least 80 per cent of the entire time it took to pour the concrete.

Q. 16. Would you say that was every day or so or every two or three days?

A. Approximately every two or three days. The exact time it is impossible to say.

Q. 17. What is your recollection as to how the concrete was poured during the construction of that building?

A. Mixed on the pavement, raised by an elevator to a hopper and put from a hopper into wheel barrows, rolled from there by niggers to the place at which it was to be poured.

Q. 18. Was any of it deposited by means of troughs or chutes?

A. To the best of my recollection it was not.

Q. 19. Have you had any experience in the reading of drawings?

A. Yes, sir.

Q. 20. Just what experience have you had?

A. Practically ever since I have been old enough to work, I have been closely associated with drawings of mechanical and architectural drawings.

Q.21. Where were you educated?

A. In public schools in Richmond.

Q. 22. I show you a pencil sketch or drawing, Defendants' Ex. [fol. 106] hibit 20, and will ask you if you ever saw anything like that used in connection with the distribution of the concrete on the Lynchburg Hotel Building?

A. To the best of my recollection I have not.

Q. 23. What do you understand to shown or declared in that drawing?

A. This drawing is to show an elevator with a hopper and one or more movable sections of troughs to convey some material.

Q. 24. How is the outer end of the first or upper trough supported, apparently?

A. I should say by either a cable or block and tackle. It is hard to say from this drawing.

Q. 25. Did you know Arthur L. Smith?

A. Yes, sir.

Q. 26. In what capacity was he connected?

A. I think Arthur L. was the man's name. He was superintendent of the concrete on the job.

Q. 27. Mr. Smith has testified that chutes of the character shown in this Exhibit 20, consisting of two and sometimes three lengths or sections of trough, which would mean a length of perhaps 20 to 30 or even a large number of feet, which would make a total semi-circular area with a radius of 20 to 30 or more feet, with the mouth of the hopper as a center, over which the concrete would have been deposited by the chutes or troughs, and that this construction was employed on the floors from the fourth to the seventh. Do you think it would have been possible to have used this construction for that amount of work without your having seen it on this job?

A. It wouldn't have been possible for them to have used it without my seeing it, but, as I stated before, I am going on my recollection.

[fol. 107] Q. 28. Where was this Lynnhaven Hotel Building located?

A. Granby and Freemason.

Q. 29. And what is it known as now?

A. Southland Hotel.

Q. 30. When was this building constructed?

A. If I remember, somewhere during 1906 and 1907.

Q. 31. How do you fix that date?

A. The fact that the Chesapeake Construction Company started the work and the Atlantic Electric Company finished it. The Atlantic Electric Company was started somewhere during that period.

Q. 32. Is there any other occurrence that enables you to further fix that date?

A. It was built during the building period for the Jamestown Exposition and we were having a lot of labor trouble and that is how I happened to be on the job, on account of strikes.

Q. 33. During the time that you were working on this building just what was your connection with the Chesapeake Construction Company and the Atlantic Electric Company?

A. With the Chesapeake Construction Company I was an employe and with the Atlantic Electric Company as an employe and a stockholder.

Q. 34. Do you recall about how high the lower end of the hopper from which the concrete was discharged into the wheel barrows was situated from the floor which was being constructed?

A. That varied, from time to time, with the construction. At times it would be just a little above the floor on which they were pouring and then at other times it would be as much as two floors above.

[fol. 108] Q. 35. You mean the hopper would be?

A. Wait a minute. That question I can't answer because I would be drawing on my imagination. If I answered that question I would give you a concrete answer of my experiences with other buildings and I couldn't give any real sure enough answer as to that in this special instance.

Q. 36. Have you any recollection of seeing the wheel barrows placed under the mouth of this hopper and carried from there to the various places on the building where the concrete was to be deposited?

A. Very distinct and based especially on an accident they had in which one section fell and a nigger rolled his wheel barrow right along down the hole.

Q. —. Do you recall about when that accident was?

A. I don't know what floor it was on any more.

Q. 37. Do you happen to recall about when the pouring of the concrete on the different floors was completed, that is for all the floors?

A. No, sir.

Q. 38. Do you remember anything about the shape or appearance of the hopper from which the concrete was dumped into the wheel barrows?

A. Set on an angle and the sides were built so that had it been continued it would have made a cone with a gate at the mouth.

Q. 39. I show you Plaintiffs' Exhibit Kerns' Sketch and will ask you to state whether or not the hopper shown in side and end elevation on that sketch corresponds in a general way with your recollection of the shape and outline of the hopper as employed during the construction of that building?

[fol. 109] A. Exactly. I don't remember all of these curves but in outline it is exactly. As I remember, it was straight and he has curves there that makes the plan look pretty but I don't remember them being there.

Q. 40. I show you Defendants' Exhibit 19 which is a photograph of this building and will ask you if you find the hopper shown in that photograph?

A. Yes, sir.

Q. 41. Designated by the letters 2 or P?

A. Either one you want to make it, P being the upper end and 2 being the lower end.

Q. 42. As a matter of fact, doesn't P go to what appears to be a stay-rod or brace there?

A. It may be.

Q. 43. You will notice the numeral 3. To what part of the hopper does that refer?

A. It don't look like it hits the hopper at all. It may be the mouth of the gate.

Q. 44. Can you see anything at all in this photograph that looks like a trough or chute leading from the hopper?

A. No, sir.

Q. 45. In your affidavit executed by you in this case on the 29th day of August, 1920, you state that "For some reason or other, for a short time, the concrete was discharged into a trough from the hopper and from the said trough into wheel barrows, by means of which it was carried to the point where it was to be poured." Will you describe, if you remember, a little bit more fully just the arrangement of that trough as used by you there?

A. It would have been a single length when the elevator had been extended above the level on which the building was being poured so as to bring it down to the wheel barrows.

[fol. 110] Q. 46. It was used only then when the hopper was ele-

vated a considerable distance above the floor, as you referred to a while ago?

A. In my recollection, yes.

Q. 47. Do you know Andrew J. Kerns?

A. That is the man that was outside?

Q. 48. Yes.

A. Yes, sir.

Q. 49. Do you remember whether he was employed on the Lynnhaven Hotel Building?

A. Yes, he was.

Q. 50. Do you remember in what capacity?

A. First, as I remember, a saw filer and afterwards in charge of the men pouring the concrete.

Q. 51. Did you have anything to do with the construction of the Vinery Building.

A. No, sir.

Cross-examination by Mr. Smith:

X Q. 51. When you were on this Lynnhaven Hotel job were you in charge of a number of workmen or were you actually working on this conduit work yourself?

A. Both.

X Q. 52. You have stated that you were there on this work when there was work to be done. I take it that the work didn't go on continuously and that you wouldn't be there all the time?

A. In the building of a concrete building of that class it is usual for the general contractor to get his forming up in sections. As soon as he gets that section done he calls on whoever has anything to do on that section and gives them a certain length of time to get [fol. 111] their stuff in the clear and he starts pouring. By the time they get that section in the clear they will have another section and the concrete men will be right behind you.

X Q. 53. What do you mean by "in the clear?"

A. As soon as you get through with your section, the section you already have, there will be another section for you.

X Q. 54. Am I correct in understanding that the electrical work was placed and held in position before they began to pour the concrete?

A. Yes.

X Q. 55. As I understand, you finished your work of setting the electric conduits before they began pouring?

A. Not on the complete floor but on one section.

X Q. 56. I understand that each floor was built up in sections?

A. Yes, sir.

X Q. 57. You finished the conduit work for one section before they began to pour the concrete for that section?

A. We finished sufficient for them to start. We might have been working on half that section and they on half.

X Q. 58. Is it true that you put the conduits in place in advance of the work of the concrete men?

A. Yes, but we always had to have some one to watch our stuff to see that it was not knocked out of place by wheelbarrows going over it, and men stumbling or material dropping on them. We had to have some one there while the concrete was being poured.

X Q. 59. Did it sometimes happen that you were sufficiently far ahead with your work to lay off a little while before you had to come back and go on with it again?

[fol. 112] A. Yes. At that time, as I say, it was only while they were building new sections. It was necessary at all times that we have some one there while they were pouring to see that our stuff was not knocked out of place.

X Q. 60. Who did you leave there, one of your workmen?

A. At that time usually myself because we were in the midst of a strike and had very unskilled help.

X Q. 61. That, as you recall, was not the uniform practice?

A. It was not uniform practice. Most anybody could stay and watch them.

X Q. 62. You stated a while ago and also in the affidavit which you filed some time last summer that for a short time, at least, a trough was used for distributing cement from the hopper to the wheel barrows and that the hopper was elevated to enable that to be done. Do you recall to what extent that operation was carried on?

A. No.

X Q. 63. But the hopper was at times elevated a considerable distance above the floor on which the concrete was being poured?

A. At times, yes.

X Q. 64. And do you remember how many lengths of trough were used in conveying the concrete from the hopper?

A. My recollection is not more than one.

X Q. 65. As you remember it, only one was used, or at least that is all you saw?

A. That is all I remember seeing.

X Q. 66. Wouldn't it have been possible for them to have used more than one length sometimes when you were not there on the job?

[fol. 113] A. Possibly, yes.

X Q. 67. That might have been done without your seeing it?

A. Yes, it might have been done without my seeing it.

X Q. 68. And in the construction of the floors from the fourth to the seventh it might have been possible for Arthur L. Smith or those in charge of the concrete work to have used two or three troughs at some time without your seeing it?

A. It might have been but I would say it would be improbable, from the fact that I had to watch our work.

X Q. 69. Would it have been possible for an arrangement such as is shown in Defendants' Exhibit 20 to have been used for a part of the work on the fourth to the seventh floors without your having seen it?

A. It would have been possible, yes, but as I say, I think it is improbable as I was there watching our work and I do not remember seeing it used.

X Q. 70. When they used a single length of trough which you do remember, was it the practice to convey the concrete down to that trough and then run it into a wheel barrow and roll the wheel barrow on off to the place where they wanted it?

A. Yes.

X Q. 71. Do you recall about how high the hopper was elevated above the floor when that was being done?

A. As I said before, if I would say how high I would be mixing up this job and some other job and I couldn't give a fair answer.

X Q. 72. But you do remember distinctly that it was elevated sufficiently to enable the concrete to run down through the trough?

A. Yes.

[fol. 114] X Q. 73. Do you remember about how long the trough was?

A. No, not accurately. As I remember it was no longer than sufficient to give it a fall, allow the stuff to run.

X Q. 74. This photograph which is Defendants' Exhibit 19 you have stated that you are unable to see anything there which might be a trough. I call your attention to the part here marked 3 and ask you whether that might not be a trough or the upper part of a trough leading from the hopper?

A. It is impossible to say. The portion there joins the building so close and there are so many marks on it that it is impossible to say what that was.

X Q. 75. The photograph is rather hazy and indistinct anyway, is it not?

A. Yes, on that portion.

X Q. 76. If there were troughs there the major portion of them would be out of sight?

A. It would be in this superstructure up here.

X Q. 77. Do you recall, Mr. Goldback, about the time when the concrete work was begun on the Lynnhaven Hotel Building?

A. Not exactly. I should say it was done some time during the summer and fall.

X Q. 78. Do you mean the summer and fall of 1906?

A. I couldn't say exactly when it was done, whether it was summer or fall, fall or spring. Any exact time would be a guess. It would be a guess if I were to express any dates on it. I do remember at one time we had ice on the building and that must have been some time during the fall or winter, but whether it was in that building or some other building, I wouldn't like to absolutely say.

[fol. 115] X Q. 79. Do you recall whether the building was put up before the Jamestown Exposition or not?

A. I think it was. I think it was put up in time for the Jamestown Exposition, if I remember right.

X Q. 80. When you were at work on this building do you recall how long a day you put in?

A. There were times when night work was necessary and other times it wasn't.

X Q. 81. Your impression of the job is that it was rushed as rapidly as possible?

A. It was rushed as much as possible to rush any job.

Redirect examination by Mr. Anderson:

R. D. Q. 82. You spoke a while ago about the forming for the different sections being completed. Just what do you mean by "sections" there?

A. In the middle of a concrete building the pillars support the slabs and the distance between two pillars is called a section.

R. D. Q. 83. To make the thing a little bit more concrete, just about how large or extensive as to area would one of the sections have been on that Lynnhaven Hotel Building?

A. Somewhere around a hundred square feet.

R. D. Q. 84. That is ten feet each way.

A. Ten feet each way or multiples of that.

R. D. Q. 85. You mean that the sections varied in size or area in that building?

A. If they have one 10 foot square or any number of ten feet squares we call that a section, that they would have a part of the form up ready for use and would say "This section is ready and you can go ahead with it."

R. D. Q. 86. The sections you have reference to are the ten foot square sections?

[fol. 116] A. Yes, sir.

R. D. Q. 87. And I also understand there were times when you were still working on a particular section, placing your conduits or whatever they were, and they were at the same time pouring the concrete on another part of that particular section?

A. Quite often.

R. D. Q. 88. At other times you would have finished your work on a section and then you would have gone to the next ten foot square section adjoining?

A. Yes, sir.

R. D. Q. 89. While they were pouring the concrete?

A. And then at times we would not be ahead of them and they would have to hold up for us to get our section finished before they could get to it.

R. D. Q. 90. Was it the general practice at that time for you to be there when this concrete was being poured, to watch your pipes or conduits or whatever it was you placed there as the concrete was being poured?

A. Yes, sir.

R. D. Q. 91. You were there instead of some one of your employes?

A. Usually.

R. D. Q. 92. Referring to the trough which you referred to a while ago, was that a stationary or a swiveled or pivoted trough?

A. Tell me exactly what you mean by stationary?

R. D. Q. 93. How was it supported?

A. To all intent it was rigid but it was not, as I remember, made fast to the top. It was slipped under the hopper, the top section extending under the hopper mouth.

R. D. Q. 94. You mean the top part of the trough?

[fol. 117] A. Yes, and the bottom section was supported in such a way that it was not readily movable.

R. D. Q. 95. Do you recall anything as to the slant of the trough from the hopper down?

A. No, sir.

R. D. Q. 96. Do you recall whether it was blocked up on trestles or blocks of some kind? Do you recall anything about that?

A. No, sir.

Recross-examination by Mr. Smith:

R. X Q. 97. When you were laying out the conduits for the work for the electric wires, some of these ten foot sections which you have referred to were naturally located a considerable distance from the hopper, I suppose?

A. Yes.

R. X Q. 98. And in your work there on the building you were generally located some distance from the place where the cement was distributed from the hopper?

A. We may have been working at some distance but our material would be distributed all over the building and we would have to go from place to place to get it and we traveled pretty well all around it when we were working there.

R. X Q. 99. Do you recall whether you were ever considerably in advance of the concrete men in the laying out of your conduit work?

A. No, sir, we never were.

R. X Q. 100. In general you had to finish one of these ten foot sections before they started laying the concrete?

A. That is right.

[fol. 118] By Mr. Anderson:

R. D. Q. 101. And also at times you prepared some of these sections which were situated or located near the hopper, did you not?

A. Right under the hopper.

R. D. Q. 102. That is not only right under the hopper but also within a radius of 20 and 30 feet?

A. Yes, sir.

By Mr. Smith:

R. X Q. 103. Did you have charge of this work continuously from the time the building was begun until it was completed?

A. No, until the rough work was completed.

R. X Q. 104. I am referring to the pouring of the concrete?

A. Yes.

Signature waived by agreement of counsel.

The further taking of depositions in this matter was adjourned to meet on notice and agreement of counsel.

VIRGINIA,
City of Norfolk, To wit:

I, F. C. Tilghman, a Notary Public for the City of Norfolk, Virginia, certify that the foregoing depositions of Charles Cooper, William T. Baker, Walter Newsom Thornton, Roland Brinkley, F. M. Glines, Carter Gay, Andrew J. Kerns, and J. Samuel Goldback, were duly taken and sworn to at the times and place and for the purpose in the caption mentioned, and that signatures thereto were waived by counsel.

Given under my hand this — day of May, 1921.

F. C. Tilghman, Notary Public.

[fol. 119] IN THE DISTRICT COURT OF THE UNITED STATES FOR THE EASTERN DISTRICT OF PENNSYLVANIA, June Term, 1920

In Equity. No. 2067

CONCRETE APPLIANCES COMPANY and WILLIAM H. INSLEY, Plaintiffs

vs.

JOHN E. GOMERY, JOHN C. SCHWARTZ, MICHAEL J. OMERA, and CONCRETE CONSTRUCTION COMPANY, Defendants

Depositions of witnesses on behalf of plaintiffs, in accordance with notice and agreement, before L. Belle Weaver, acting as special examiner by agreement, at Los Angeles, California, room 212 Stock Exchange building, March 11, 1921.

Present: Arthur M. Hood, Esq., and C. E. Fleming, Esq., for plaintiffs; George P. Barton, Esq., for defendants.

LEE CALLAHAN, a witness produced on behalf of plaintiffs, having been first duly sworn, deposes and says as follows:

Direct examination by Mr. Hood:

Q. 1. Please state your name, age, residence and occupation.

[fol. 120] A. Lee Callahan; residence, 1622 West 24th Street, Los Angeles, California. My age will be 55 years the twelfth of this month. Occupation is architectural designing and building. Registered under the name of Lee Callahan & Sons, City of Los Angeles, California.

Q. 2. Are you the Lee Callahan who made application for United States Letters Patent No. 948,719?

A. Yes.

Q. 3. When did you come to Los Angeles?

A. It was in November, around the 26th, of 1907.

Q. 4. What did you do when you arrived in Los Angeles?

A. I immediately began to look around to secure a job, and in doing so I saw a reinforced concrete building under construction here in Los Angeles on the Majestic site, and known as the Majestic Theatre Building. I sought the contractors of the building, and met Mr. Hugh W. Bryson, connected with the F. O. Engstrum Company, general contractors. In talking with Mr. Bryson I stated that I was practical in the handling of large work of various construction, and especially so in concrete. That I had ideas whereby I wanted to apply concrete in new principle, as I term it, of handling concrete through pipe lines by the means of hoisting on a tower with a bucket and the electric hoist or other power or method of hoisting the materials, to a point sufficiently above my work that I might reach all parts of my building and foundations or superstructure work in a thin solution of mixture or of plastic consistency that I could flow it through these pipes or troughs, in other words, that it would slide through these devices to the point of distribution, so sought. In talking with Mr. Bryson I found he became interested with my explana- [fol. 121] tion or ideas. He told me to proceed with the arrangements of such work. Now, I will not be positive whether there was a small little section of a tower or not. I found the conditions of the work thus: The concrete had been placed most of it to the ground level, and a section of concrete had been placed on what would be termed the first floor of the Broadway building entrance side, on the main entrance of the building. The forms were being placed, and a good portion of the forms and the front section of the building were being placed preparatory for the arrangements of the second floor slab of their front part of the building. Now, to proceed with the work——"

Q. 5. Please describe the construction which you described to Mr. Bryson, in your early interviews with him; that is, tell us what you told Mr. Bryson as to the details of the construction of the apparatus which you wanted to use.

A. I wanted to make, the best I can recall, something like four-inch round pipe, that I would place on this boom pole that I proposed to attach to the tower and to extend out from the tower being secured to the tower with an adjusting or a swivel joint so I could oscillate it, and at the end of this pipe at the tower I could so construct a little pan which would be open and would sleeve onto the end of this other pipe, and would extend back inside of the tower to the edge of the tower sufficient to extend under a spout or a gate, rather; what I mean by a gate, is I had a slide that I could work up and down with a lever that works by which I could open the hopper that the plastic concrete could slide in this, so that when I raised this gate it opened the bottom of a hopper, that I had built inside of the tower, that the concrete, when dumped into, as a receiving hopper, received [fol. 122] this plastic or soupy concrete, and when I would raise this gate, with a man there in the tower to operate it, it would let this soupy concrete flow into this receiving pan which was conveyed to this small pipe down to the point of this little boom. This boom and pipe section I now speak of is held in position to the tower by

means of a small rope or a steel cable controlled by block and tackle. One end of the tackle being fastened to the tower, at a sufficient angle above this hopper that when it would carry the outward end of this boom that carried the flow of concrete to this point, at the outward end from the tower of this pipe I had like an eighth bend, made like an elbow, to cause the concrete to slide down, went straight down. Around that I had a little band or a swivel, by which I fastened another little receiving pan which was open, and similar to the first pan described at the tower. That sleeved onto other pipes, and those pipes we would swivel, thus enabling it to swivel this lower section, to the various positions in which I wanted to pour the concrete. Now, these outward sections, they were down in reach, and we would place trestles or horses, we would call them, or other little temporary means of stagings or means to support that pipe, the weight of it.

Q. 6. After you had had this preliminary conference with Mr. Bryson, what happened?

A. Mr. Bryson told me to proceed with the work, the preparations.

Q. 7. When did you go on the job?

A. The day after Christmas, 1907.

Q. 8. At that time what was the condition of work on the Majestic Building?

[fol. 123] A. As I stated previously, the concrete were in place to about the ground level, including the floor slab of the front section of the building, and the forms for the first story in preparations for the second-story slabs of the front section or Broadway side of the building was in place. I find—I won't be positive—whether there was a little preparation or a tower that had been used there for some order there or not; I couldn't state.

Q. 9. Please describe just what you did, taking it up by various steps, toward erecting an apparatus such as you had in mind, for the purpose of spouting concrete on this building?

A. I proceeded to direct the erection of the tower and the placing of equipment necessary for the handling of concrete work. I first had, if there were any tower there at all, it removed, and I directed the building of the tower on the south side and about half-way back of the Majestic Building. I had a pit dug and started the base of my tower low enough that when the bucket was down I had one pit sufficient that I could set my mixer far enugh below the surface of the ground to admit easily of dumping my material into the mixer. The bucket, understand you, is at a still lower level, sufficiently low that when the concrete was mixed I could readily dump it into the bucket. This bucket was arranged to run or slide on the outside of this outside of the tower. Our hoists set back in line of the side of the tower sufficiently that our cables running from the drum of the hoisting apparatus under a sheave at base of the tower and passing through the side of the tower, this cable extending to what I call the cross-head or a frame with two sheave blocks, and across and to drop perpendicular back [fol. 124] to the ground where I could fasten to the bucket. That bucket was arranged that its frame slid against the track which was built on the outside of the tower to hold in position while convey-

ing the concrete to the top of the tower. In the top of this tower I arranged a hopper, receiving hopper, I called it, or a box, so arranged and lined with sheet metal, and I dumped this concrete into this hopper; and as I stated before, conveyed into the pipe line. In the meantime I had some pipe, galvanized iron pipe, and some open sections or receiving pans that I have described, prepared for this work. I made rough sketches for this work, which I could readily enable the workmen to carry out such apparatus as I had in mind.

Q. 10. How and where did you mount this pan in connection with the hopper?

A. This pan and hopper were of considerable height above the level or sections of work desired to be poured, for convenience of proper gravity, by which to flow the concrete.

Q. 11. Describe the manner in which the pan was mounted on the tower, and state what its capabilities or movements were, if any?

A. The pan at the tower, and the boom pole, was so arranged by means of a swivel joint or revolving action, that I could swing this boom pole, being controlled by the block and tackle holding this boom pole and first sections of pipe into position, that in oscillating this apparatus that my guy lines controlling this section of pipe would not be tight on one side and slack on the other at the time of oscillation, and it was so placed that this receiving pan at the tower or at this hopper in the tower would always be in position to receive the soupy or thin concrete without splashing out and giving us bother. In that way we could oscillate in any direction on the building.

[fol. 125] Q. 12. Please state whether or not the hopper in this first apparatus of yours had an open bottom.

A. This hopper that I have spoken of is open at the top, and it is open at one side, and the side facing our receiving pan, with a little shoot-out which I have described as a gate with a lever controlled by a man to open and close that. When that gate was raised, it would let the concrete slide out into this receiving pan. If he wanted to shut up for any cause, or for any trouble, it would close that gate, and we had a closed hopper. In other words, to feed that material in such quantities as we so desired from the bottom of that hopper.

Q. 13. State as nearly as you can the time when you had this apparatus completed and you first delivered concrete through it to the forms.

A. The best I recall, it was only a few days either just before or about the first of January, 1908. It was only a matter of three or four days to get in readiness, and we were pouring concrete about that time.

Q. 14. What, if any, trouble did you have with this apparatus after beginning?

A. At the beginning naturally we had some trouble; first had about a four-inch round pipe, and it was a little too small, and it would clog up at times and cause us a little delay, and then I had some larger sizes made. We was experimenting to some extent at

that time, and I had no question in my mind of the success of what I had.

Q. 15. When you found that this four-inch pipe would clog up at times, what did you do?

A. I proceeded to have larger pipe made.

Q. 16. And about how soon did you get this larger pipe in?

[fol. 126] A. It would only take a matter of a day; just long enough for the sheet metal department to make up the pipe that we would want.

Q. 17. And when you got the larger pipe in, did it work satisfactorily?

A. It worked considerably better than the first pipe, but yet we had some little trouble with that second size of pipe.

Q. 18. Then what did you do?

A. Then I ordered still a larger size, about a seven-inch pipe, and that worked entirely satisfactory, enough so that we went right ahead with our concrete pouring on the Majestic Building.

Q. 19. About how high from the ground did you place the hopper at the beginning of your operations?

A. The best I recall, I built my first tower something like fifty to sixty feet; I wouldn't be positive, but it was sufficiently above the operation of the work that I could pick up and pour concrete on the second floor level or back down to pick up cantilevers, stage work, or work anywhere back to the basement, as the case might be; that I could have sufficient gravity to avoid stoppage on the line so I could proceed with my work.

Q. 20. After you got the concrete poured up to the second floor level, what did you do with the apparatus then?

A. Naturally, as we would proceed upward with the construction of the building, we would extend the height of our tower and making apparatus or pipe lines so we could slide those right up the tower, and in the matter of a few hours, with four or five good mechanics, we would have our cross-heads, our hoppers, and our boom apparatuses, moved up in the proper position to accommodate the work at this stage of construction.

[fol. 127] Q. 21. When you had poured the concrete up to the second stage of construction, what did you do then?

A. We continued a like principle until the work was completed, sending our towers on up accordingly.

Q. 22. How tall a building is this Majestic theatre?

A. I believe it is an eight-story building.

Q. 23. Please state whether or not this apparatus which you have described was used in pouring all of the concrete of the building after you began its use.

A. All of the concrete of the entire building was poured with this apparatus, and we even mixed our topping for the finished floors, so all of the concrete work, flat and structure, were performed through and by the means of this apparatus.

Q. 24. Please state whether or not you found the use of this apparatus resulted in any saving of labor costs.

A. Very materially so.

Q. 25. What sort of a finished structure, that is, what sort of finished concrete work, was accomplished by the use of this apparatus? How does it compare with concrete structures produced by the old wheel-barrow method?

A. The old methods of placing concrete and tamping would not give us the dense principles in concrete, or in other words we could get a great deal more dense concrete, more in a homogeneous principle, and a concrete that would stand a far greater test than the old principle.

Q. 26. You have mentioned the fact that during the building of this special apparatus, you made some sketches. Did you preserve those sketches?

A. I think I did, yes, sir.

Q. 27. I am referring now to the sketches which you say you made during the time you were first building this apparatus at the Majestic Theatre.

[fol. 128] A. I made rough sketches in pencil that I could convey the idea to other workmen in the making of parts of the apparatus from time to time through the progress of this work.

Q. 28. Have you still got those particular sketches?

A. I have got those sketches, but I improved on those sketches from time to time that I retained, in pencil; in other words, made it a little more compact as I went along. That sketch I believe I have.

Q. 29. You mean that you didn't keep the original sketches, but that you made a later sketch with some improvements?

A. Yes.

Q. 30. Will you please produce a rough sketch of the apparatus which you actually used at the Majestic Theatre job?

A. I have a little rough sketch here that I have sketched out in line as to the locations and trying to convey the principles that were carried out on the Majestic Building.

Q. 31. When did you produce this sketch?

A. This sketch, this morning. I recalled it in my mind, as near as I could recall it in my mind.

Q. 32. You produced this sketch at my request, did you not?

A. I did.

Mr. Hood: Counsel for plaintiffs offers the sketch in evidence and the same is marked Plaintiff's Exhibit A, Collation Memory Sketch.

Q. 33. Will you please produce the sketch to which you referred in your answer to Q. 29.

A. I do so.

[fol. 129] Q. 34. About when did you produce this sketch?

A. This sketch I was working on from directly after I commenced my work on the Majestic, and I finished this sketch sometime in the month of August, 1908.

Q. 35. I notice that this sketch has been folded into rather a small compass. Do you recall why it was so folded?

A. If I mistake not, it is a sketch that I submitted to my attorneys in Washington, D. C., James L. Shenky & Company, for a search with the view of letters patent.

Q. 46. Do you know anything about the rubber stamp that "Received December 17, 1908, Answered," which appears in the upper right-hand corner of this sketch?

A. *I received an answer; the exact date I couldn't recall, but I received an answer from my attorneys, and in that search or letter I was informed that my devices were patentable, or words to that effect, or gave me that impression.*

Q. 47. Who placed this rubber stamp date on the drawing, do you know?

A. I couldn't mention.

Q. 48. Was it on there when the drawing came back to you from the patent attorneys?

A. I couldn't state when it was placed. It was on there when I received the papers back.

Mr. Hood: Counsel for plaintiff offer a photostatic copy of the sketch in evidence, and the same is marked "Plaintiff's Exhibit 9, Caldwell Drawing." It is stipulated that the photostatic copy, Exhibit 9, may be received and considered as with the same force and [fol. 130] effect as the original, the original to be subject to production upon call of opposing counsel.

Q. 49. When you raised the beam of the Majestic apparatus from time to time, just how did you do it?

A. We had it arranged where we could take a set of block and tackle and pick up this little crosshead or crosspiece, which the beam was fastened to, down at the base of the tower—I mean, where the beam started up from the tower, simply lift with the block and tackle; fasten our block and tackle at the upper end of the block and tackle at a sufficient height at the end of the tower that we could lift this apparatus, if not to open power wires as we desired, we could lift the end of the rope as cable controlled by these blocks and tackles down to the ground level, and back around what we call the Gipsy or Nigger-head, a little attachment on the side of the boat where we could take a couple of turns around that, and by means of the boat running a man would take in slack as we call the slack rope, and by that method or means we could lift the up the side of the tower to whatever new position we sought to operate from. Likewise, we lifted our bigger units of the tower to give the concrete on to the bricks.

Q. 50. Do you recall having drawn this drawing, Exhibit 9, to anyone, while you were making it, or at about the time you had it completed?

A. Only to Mr. Brown.

Q. 51. How long did you stay on the Majestic job?

A. I was on the Majestic Building from the day after Christmas until the concrete was poured, sometime there in the summer of 1909. I believe it was down in the latter part of July, or in July,

[fol. 131] sometime about that time. The building wasn't finished, but the concrete was poured.

Q. 42. What did you do then?

A. The F. O. Engstrum Company had taken a contract for a large reinforced concrete building known as the Timken Building in San Diego, California, and I was informed by the Engstrum Company that I would be the general superintendent of the construction of that building; and about the best I recall somewhere around the 18th of August, 1908, I took charge of the construction of the Timken Building spoken of.

Q. 43. And what sort of an apparatus, if any, did you use in the fabrication of that building?

A. I used the same apparatus as I used on the Majestic Theater in 1907, that I have spoken of first building, and the work being done with the same apparatus in the beginning of 1908, as stated.

Q. 44. What do you mean by the same apparatus?

A. I used the same principles, only I improved on the principles, and built my apparatus of a better or more economical construction. I overcame the little difficulties that I found in my first apparatus, and was just more perfecting the various parts.

Q. 45. Will you please produce a photograph of the apparatus which you used at the Timken Building?

A. Yes. There, Mr. Hood, is an apparatus as I built the Timken Building from its foundations to its completed status. Here is my photograph standing in a directing position where I am pouring the concrete in the main cornices and roof slab of the said Timken Building.

Q. 46. About when was that photograph taken?

A. That photograph was taken, the best I can recall, in about March or April; I won't be positive which; of 1909.

[fol. 132] Q. 47. How does the apparatus shown in this photograph which you just produced, compare with the apparatus as you began to use it in the foundation of the Timken Building in August, 1908?

A. This apparatus was the same.

Mr. Hood: Counsel for plaintiff offers in evidence the photograph produced by the witness, and the same is marked Plaintiff's Exhibit C, Photograph of Timken Building Apparatus. It is stipulated that a reproduction of this photograph may be used with the same force and effect as the original.

It is also stipulated that if Lee Passmore, of San Diego, California, were called and examined as a witness on behalf of plaintiffs, he would testify that he took the negative from which this photograph was taken, and that said negative was made by him on the roof of the Timken Building, San Diego, California, about March, 1909.

In view of the fact that defendants at this hearing are represented by local counsel, the above stipulation is subject to the condition that it may be withdrawn by notice from defendant's principal counsel within ten days after the original photograph has been submitted to him for examination in Chicago.

Q. 47. I notice that in this photograph, Exhibit C, the second swiveled pipe section is open for some distance at its upper end. Will you please describe how this lower pipe section was connected to the boom support of the pipe section, and the purpose of this open upper end.

A. The section shown on the second jointing of pipe hanging onto that elbow or spout of the pipe extending down through the [fol. 133] boom line is held by a swivel joint, which works and is hung around that lower section of the first line of pipe, and to avoid trouble of clogging up at this particular point, and for convenience of workmen to get to it, and to take care of an overflow, even though it was clogged up below that point, without giving extra bother in the main line.

Q. 48. Did this apparatus at the Timken Building work satisfactorily?

A. Perfectly. It always attracted quite an interest of the public to see the new method of placing concrete. Naturally it was delightful to us to demonstrate.

Q. 49. After you completed the work at the Timken Building what did you do then?

A. After finishing the concrete work of the Timken Building I was sent to Phœnix, Arizona, to do a reinforced concrete piece of work for the F. O. Engstrum Company, and the finishing up of a reinforced concrete building that they had the contract to do there.

Q. 50. Did you use the same sort of apparatus on that building?

A. Yes; as far as was necessary to use any apparatus at all; I poured quite a bit of concrete in that building; I always used the same apparatus in any concrete work I had to do.

Q. 51. On about how many reinforced concrete buildings have you used an apparatus for chuting concrete, comprising a tower, hoist bucket, a hopper to pour it on the tower, and provide it with a gate, and raised from time to time on the tower as the work progressed, a boom pivoted to swing horizontally on the tower, and raised at its pivot point from time to time on the tower as the work [fol. 134] developed, the boom being supported entirely by the tower, a conduit or pipe supported by the boom, and so arranged as to be capable of receiving the concrete from the gated hopper no matter in what position the conduit might be swung from side to side, and the second pipe section swiveled to the lower end of the boom supported pipe section so as to receive the discharge from the boom supported pipe section?

A. Quite a number; I don't know that I could recall at this time all of the buildings so constructed, but I will mention a few as I can recall it, to-wit: the Ferguson Build- on the corner of Third and Hill Street, in Los Angeles, California, an eight-story building. George W. Marston Building, in San Diego, a large building, of dimensions 100 by 200 feet, and five stories. In the same town, the Bridges Building, 100 by 100 feet square, with basement, six story building. The Watts office building, in San Diego, a ten-story reinforced concrete building. A building in San Diego also, the Pioneer warehouse, a six-story building, 100 by 100. And va-

rious other pieces of work that I can not very well recall at this time; but I have always used that method or apparatus of handling concrete down to the present time.

Q. 52. What is the lattice arm which extends diagonally across the middle of this photograph, Exhibit C?

A. You mean this boom pole running down here, which is built of angle iron and small steel bars? That is the boom pole in which the pipe line is held in position and is so arranged on the tower in this particular case where I could oscillate and cover or reach about three-fourths of the building without moving the base of the boom pole where it was attached to the tower. Then when I moved, [fol. 135] all that I had to do was to unloose that little cable that I had locked around this swivel, and I could just simply slide the base of that boom pole at the tower across to the other corner. The same connection or control was handled where the dies carries the outward end of this boom to another cross-head, to slide that just across to the opposite side of the tower, we could reach three-fourths of the building in our swinging movement of the boom.

Q. 53. How much of the concrete of the Timken Building was delivered to the forms through this chuting system?

A. In its entirety.

Q. 54. After you had made the sketch, Exhibit B, did you have any more complete drawings made?

A. That is it.

Q. 55. Will you produce that drawing?

A. That is a drawing on tracing cloth that I had or employed a draftsman by the name of Carl Reger. He was the superintendent for Harris & Albright, the architects of this Timken Building. Knowing Mr. Reger quite well, I had him make this tracing here produced on tracing cloth from the pencil sketches I had previously made, and also personally suggested.

Q. 56. In your reference to pencil sketches, in your last answer, do you mean Exhibit B?

A. I mean that is the one I present to you here on this little white paper. (Witness refers to Exhibit B.)

Q. 57. Where is Mr. Reger now, do you know?

A. His official address I could not give, but I have a letter from him, a few months ago, and I believe he was at Wheeling, West Virginia; he was in West Virginia; that was his old home place. [fol. 136] That was the last address that I had of him. His residence at the time of this drawing was in San Diego, and he later moved to Los Angeles.

Q. 58. I notice that this tracing which you have produced is dated November 20, 1908. What does that mean?

A. That was about the time of the completing of this drawing or tracing.

Q. 59. I notice on this tracing the words "Patent allowed." What does that mean?

A. Well, I had a letter—I won't be positive just what it was—stating my ideas was patentable, and I authorized at my own suggestion to Mr. Reger to state that on my drawing here, and that my

attorneys, or words to that effect, would understand from these drawings, I was preparing to send my attorneys at Washington, D. C., James J. Sheehy & Company.

(A blueprint of the tracing just produced by the witness is offered in evidence as plaintiff's Exhibit D, Callahan, November 29, 1908, drawing.)

Q. 60. When did you first think of an apparatus for chuting concrete, comprising a tower, hoist bucket, gated hopper, vertically adjustable on the top, a verticaly adjustable boom pivoted to swing horizontally on the top, and a pipe carried by the boom and arranged to receive the discharge from the hopper?

A. I first conceived the idea of handling concrete in a spouting attitude with apparatuses, of that sort, in 1901.

Q. 61. Do you recall having described such an apparatus as is described in Q. 60, in detail, to anyone prior to your conversation with Mr. Bryson, prior to Christmas, 1907?

[fol. 137] A. I have had no conversation or expressed my principles and purpose in any detailed order until in 1907 with Mr. Bryson.

Q. 62. Prior to that time had you had any opportunity to erect an apparatus such as you have had in mind, in connection with a reinforced concrete building where the concreting was to extend several stories above the ground?

A. I had not.

Q. 63. Prior to your coming to Los Angeles, had you done any experimenting or any work in connection with obtaining a proper concrete mixture of such character that it would flow through spouting?

A. I had.

Q. 64. State briefly what that experience had been, and the times when it was had.

A. Well, as I recall, in 1901, at Colorado Springs, Colorado, and for the Ben Brewer Briek Company, Ben Brewer, the owner of a residence, in which I supervised the entire building, and such building had a concrete foundation up to and a little, I just remember, above the ground level. That foundation I placed, by mounting my mixer up from the ground on a little frame work or platform, and I made some wooden troughs or boxes, open boxes or troughs; nailed together three boards with a bottom and two sides, and I made that concrete soupy enough, or of a plastic consistency, that I could let it run through these boxes and over to the places where I wanted to deposit it; and I found that I got fine results in that crude way of handling it, and I felt very much elated that I had done away with the idea and use of the old wheel barrows and tamping it with a rod, tamping rod, or tamping block. After that, in 1903, I believe it [fol. 138] was, in June, I believe it was, Ben Brewer Brick Company had taken a contract for a bank and hotel building at Colorado City, and would be properly located on the corner of Colorado Avenue and Court Street, in Colorado City, Colorado Springs. I had quite a little concrete there and basement work that I poured or placed in the same box principle that I did the foundation. I also

had some other foundation in a similar way during 1903 and beginning of 1904. In 1904 I was the superintendent for the same company, with new members in it, in addition to Mr. Brewer, of the building of what is called a silicated brick. It was a process whereby we could crush stone and pulverize it, and there was various foundations of considerable amount of concrete and I placed that concrete, all being below the ground levels, in the same manner as I have described of the first work mentioned. In 1905 I placed another foundation for the same brick concern, and the same nature of work, and in 1907 I came to Los Angeles, California, and had my first opportunity of fully presenting my ideas for the use of concrete construction, and an apparatus to so conduct such work, and with the interview that I had with Mr. Bryson mentioned in the beginning of my evidence, to fully set forth and develop my ideas which I had very fixed in my mind for a number of years.

Q. 65. Is Mr. Ben Brewer living?

A. The last information that I had about Mr. Brewer, he is dead.

Q. 66. Do you remember about when you instructed your patent attorneys in Washington to make application for patent 948,719?

A. To recall the exact dates, I couldn't make that, but I believe [fol. 139] it was shortly after I commenced the work on the Timken Building in 1908; my first correspondence possibly was September or October; I wouldn't be definite about that; anyway, it was as soon as I could get my drawings in proper shape to submit to my attorneys in Washington.

Q. 67. Have you copies of that correspondence at the present time?

A. I have not.

Mr. Hood: Direct examination closed.

Cross-examination by Mr. Barton:

X Q. 68. Where were you born, Mr. Callahan?

A. In Kentucky.

X Q. 69. You had certain interferences in connection with the application for your patent, did you not?

A. I did.

X Q. 70. With whom?

A. With Mr. Theodore Emtman, and I believe one Mr. Anderson, if I mistake not. Anyway, there were two interferences in my case, with this apparatus mentioned.

X Q. 71. Was Mr. Arthur L. Smith a party to one of those interferences?

A. Mr. Smith or Anderson; I won't be positive of that. Anyway, there were two interferences. Smith, I believe, is correct.

X Q. 72. In the patent to Smith, No. 948,746, application filed February 25, 1909, I find the following as the first claim thereof: "1. In a device for distributing concrete, means for elevating the concrete to a point above the plane of the work to be performed; a hopper adapted to receive the concrete so elevated; a primary dis- [fol. 140] tributing pipe revolubly mounted beneath the hopper;

and a secondary distributing pipe revolubly mounted beneath the mouth of the first-named distributing pipe, substantially as described." I show you Fig. 1 of the drawing of said Smith patent, in fact, hand you a printed Patent Office copy thereof. Did you in that interference concede that Smith was the prior inventor of what is described by the language of the first claim which I have quoted?

Mr. Hood: The question is objected to as not proper cross-examination, the witness having been asked no questions relative to the interference. The question is also objected to as incompetent and not the best evidence, because the records of the Patent Office show what, if any, concessions were made.

A. I did not concede, because I felt, when I was notified of the interference, that he was trying to impose upon my ideas and principles, being such a short time after I had made my application; in fact, my attorneys at Washington, D. C., had so informed me, that my rights were patentable and would be protected, or words to that effect; in other words, I felt and realized that the said Smith mentioned was endeavoring to copy from my apparatus.

X Q. 73. I call your attention also to claims 3 and 4 of the said Smith patent, which read as follows:

"3. In a device for distributing concrete, a concrete elevator; a revolubly mounted distributing pipe adapted to be fed by said elevator; a second distributing pipe revolubly mounted at the mouth of the first-named distributing pipe, and means for controlling the angle at which said distributing pipes are mounted, substantially as described.

[fol. 141] "4. A plant for concrete construction comprising an elevator provided with means for receiving and raising concrete, a chute adapted to receive the concrete raised by the elevator and to deliver the same by gravity, said chute being inclined and being movable horizontally to shift the point of delivery of the concrete, the lower end of said chute being provided with a horizontally rotatable delivery pipe."

I wish you would take your time, read over the descriptions of the apparatus as set forth in said claims 3 and 4, and, if you desire, you may consult with your counsel on the subject, and after doing so, I wish you would give your own ideas as to how your invention as developed, we will say on the Timken Building, and as described in your patent, differs, if in any respect, substantially from the mechanical structures described by the language of said claims 3 and 4.

Mr. Hood: The question is objected to as not proper cross-examination, and as wholly incompetent. The witness is advised that he need not answer a question of this character, which calls for an expression of opinion, unless he so desires, until he is ordered so to do, by the Judge of the United States District Court of this District. It is not necessary for you to answer this question at the present time.

A. I can answer the question in this: there may be some little difference in the mechanical device that he has used or endeavored, as I call it, to sidetrack or get by the principles that I have set forth. The principle of handling concrete by oscillation, he uses a pipe, I see [fol. 142] here, by block and tackle, which I had formerly used in the various makeups of my work. And a suit or interference was taken after my application had been made, and he had had plenty of opportunity, and in fact I believe, the best I can recall, that said Smith had previously visited my work as I was pouring concrete, to the principles I have previously at this examination stated.

X Q. 74. The block and tackle arrangement, you mean, is substantially the same as the arrangement of the boom?

A. It is not; it is only a temporary means that he can operate with, but it is not satisfaction; it is not economical, and it only conveys a small principle of purpose, and could be made applicable only in pouring concrete, as I would term it, in a crude way.

X Q. 75. Did you ever use the block and tackle arrangement itself?

A. Yes; and used the cable and guy lines where I had run it hundreds of feet away; four or five hundred feet distant from my tower down cable lines, always arranging my spouting or pipe line so I could get an oscillating motion, so as to avoid choking up, stoppage on the line.

X Q. 76. What is your reason for thinking that Smith ever saw any of your work?

A. It followed so shortly after my application, with the two interference suits, that it appealed to my mind that he was infringing or copying, personally being on my job before filing of his paper.

X Q. 77. How did the tower, the tackle, the skip, and the hopper, and the pipe of the Smith patent, differ from what you used on the Timken building?

Mr. Hood: The question is objected to as not proper cross-examination.

[fol. 143] A. The tower seems to be constructed on the same principle any more than he has some little different method of shoring or anchorage, as you might call it. I see he has some little method of cross-head or an arm, by which he shows here, mechanically speaking, a little different method of construction, but carrying out or endeavoring to carry out, the same principle of a plastic consistency of concrete construction.

X Q. 78. Now, do you really believe that Smith got up his device after he had actually seen your structure at the Timken Building or elsewhere?

A. No question in my mind.

X Q. 79. You consider it practically copied, do you?

A. I do; any more than he is trying to dodge it on mechanical equipment only. You see, my ideas and apparatus is from a process of principle, or principles, rather, whereby I have used the makeup of many and varied principles of mechanical construction, by which to produce a product that I felt would almost revolution-

ize construction work through a principle of concrete. And it didn't make a lot of difference whether it was a round pipe, an open pipe, or what method, through this process or principles, and the use of these various devices, as they might be, in placing this concrete through these motions giving us the desired results that I was working for; and it had proven, beyond a question, of merit.

X Q. 80. And you think Smith saw that and tried to gobble it up?

A. In fact, I know it.

X Q. 81. What did Smith use that is of any importance that you did not use?

[fol. 144] Mr. Hood: Objected to as not proper cross-examination. It is understood that this objection is to be considered as entered against all inquiries relating to the Smith patent.

A. He hasn't used anything that would be beneficial.

X Q. 82. And how is yours any better than Smith's?

A. I can use it much readier; use it with less labor; and for many and more varied purposes.

X Q. 83. And which part of yours do you claim makes yours better than the parts you claim that Smith took from you?

Mr. Hood: Objected to as not proper cross-examination.

A. You see, from parts as Mr. Smith applies them here, as I may state from this letters patent, so presented me here, patented February 8, 1910, under serial No. 948,746, he can only use, as I have previously stated, in a very cumbersome or impractical way of appliance, and he has only touched upon a few points of good many points that I have submitted in my statement for letters patent, the apparatus in which I use I use it for various purposes, not only in pouring concrete, but I have used my boom arms and poles for construction work. What I mean, by the construction that I speak of, the placing of forms, such as column forms, beam forms; I use a part of the same apparatus for the hoisting of steel, or to adjust and lift stages to take up varied building material; and I have even used down my boom lines and my open trough for hoisting of bricks and dumping them into a similar hopper, but a little differently constructed, and sliding them off over openings or places [fol. 145] of inconvenience of getting to at the time being with other construction work, that I might carry on two points of construction at the same time, which in this you couldn't do anything of the sort. But I am using not all of this apparatus, but part of this same apparatus, and this same tower and all and varied principles in construction work of heavy buildings.

(A recess was thereupon taken until 1:30 P. M.)

X Q. 84. I show you Defendant's Exhibit 44, A, B, C, D. Will you look at them and state whether you have seen these photographs or duplicates of them prior to this time?

A. Yes, sir; down at the Majestic Theatre Building in Los Angeles. I recognize the faces of the men there.

X Q. 85. Among the men do you recognize any that you can call by name? If so, name them.

A. Charley Malmgreen; a man by the name of Smith; I can't recall his initials, but I know his face very well. I know the boys' faces, but I can't recall their names; they are all familiar to me.

X Q. 86. George Eberhard?

A. (Witness indicates George Eberhard on photo.)

X Q. 87. George Eberhard was the foreman?

A. George Eberhard was the general superintendent at the time I took charge of the work; didn't stay through the work. Eberhard was there only a short time after I was there. We didn't get through pouring the auditorium part.

X Q. 88. Does your figure appear in that group?

A. I don't believe I am in that picture; in fact, I never paid much attention to any photograph that was taken, unless they—I had no occasion to take them, and didn't care anything about them.

[fol. 146] X Q. 89. You weren't then thinking about taking out any patents?

A. Yes, sir; I had in mind for the patents before I even saw that building; but I wanted a building that I could work out for the superstructure work; but I had it in mind for many years.

X Q. 90. Did you ever take out or ever apply for other patents than this one before?

Mr. Hood: Objected to as immaterial.

A. Other than this apparatus you speak of?

X Q. 91. Yes.

A. Yes, I have taken out other patents.

X Q. 92. Have they been issued?

Mr. Hood: Objected to as immaterial.

A. Yes.

X Q. 93. Were there other photographs than these four exhibits, 44 A, B, C, D, taken, of the progress of the work on the Majestic Theatre Building, to your knowledge?

A. I couldn't say.

X Q. 94. Mr. Parker has stated that you were there at the building as a straw-boss. What was your work as straw-boss at that time?

A. When I first started on the work I only applied for a position, whatever the opening might be. As a journeyman, you might say. And after my acquaintance with Mr. Bryson, I was put in charge as what you might call a straw-boss. In other words, I had complete supervision of the handling of the concrete, and in doing so I acted as straw-boss supervising the carpenters for the form work. Later on I supervised the laying out and general construction of the work.

[fol. 147] X Q. 95. Who were your superiors in connection with that job?

A. Mr. Eberhard when I first started was in charge as the general superintendent. Mr. Eberhard didn't stay but a short time after I went on the job, and I had charge of the job toward the latter end of it, and when they got ready for the brick work and terra cotta work I believe there was a man by the name of Johnson, I can't recall the initials, who went in there as general superintendent, because I was preparing to leave to take up the supervising work of another contract in San Diego for the F. O. Engstrum Company.

X Q. 96. Did you see and talk with Mr. Theodore Emtman in connection with that work?

A. I didn't know Mr. Emtman. I never have met him that I ever knew of. In fact, I had never heard of him, as far as I can recall.

X Q. 97. Do you know him now?

A. I only know him casually when I see him.

X Q. 98. What is the date, as nearly as you can now recall, of your first seeing him to know him?

A. Well, it was—it must have been a year or more after I went to work for the Engstrum Company, that I ever met Mr. Emtman. My work was mostly, aside from the Majestic Theatre, out of the city, while Mr. Emtman, who was a superintendent for the Engstrum Company, worked mostly in the city of Los Angeles or close around, and our occasions to have met was only by chance of meeting at the main office or something that way.

X Q. 99. You are quite sure that you never talked with Theodore Emtman about any of the apparatus that was used on the Majestic Theatre Building for placing the concrete. Is that correct?

[fol. 148] A. I never talked to Mr. Emtman at all about reinforced concrete, or construction work in any way.

X Q. 100. If I recall your testimony, you have stated that you had never described the structure of the invention of your patent in suit as a whole to anyone until you described it to Mr. Hugh W. Bryson in the latter part of the year 1907. Is that correct?

A. That is correct.

X Q. 101. We have already referred to the structure of the Smith patent. Will you state what, if anything, at that time you described to Mr. Bryson over and above what is shown in the Smith patent to which we have referred?

Mr. Hood: This question is objected to as not proper cross-examination.

A. I had fully talked of my plans, in detail, in the gravity system of pouring concrete, and I talked with Mr. Bryson fully and conclusively as to all of my details before they was fully submitted to my patent attorneys in Washington.

X Q. 102. And what details did you describe to Mr. Bryson before they were submitted to your patent attorneys—what details that are not substantially shown in the Smith patent?

Mr. Hood: Question objected to as immaterial and not proper cross-examination.

A. I believe that I previously have fully stated the difference, if there was a difference, in mechanical equipment or construction of some little device or something like that. That was, mechanically speaking, a little bit different, or something like that, that he was using.

[fol. 149] X Q. 103. Nothing different that amounted to anything?

A. No, sir.

Mr. Hood: The question is objected to as incompetent.

X Q. 104. Do you recall any of the principal men who had charge or supervision or took an active part in the management or planning of the Majestic Theatre concrete work, except Mr. Bryson, here present, and I suppose you would remember Mr. L. A. Parker, and you have mentioned Mr. George Eberhard. Now, are there or were there others connected with that work that you now recall?

A. No, nothing only just a journeyman for the ordinary handling of work, perhaps the supervising, and Mr. Parker, of Maybury & Parker, engineering and structural work of placing of steel and such as that. I knew Mr. Parker and Mr. Maybury.

X Q. 105. What is the very first conversation you remember that you had with anyone about applying for a patent upon the structure which is shown in the patent in suit? This patent is before you.

A. In the talking of a patent, I talked with Mr. Bryson, mentioned previously here, a short time before I went to San Diego to take charge of the Timken Building; that I was going to apply for the patent just as soon as I could get the papers in the proper order to be presented to my attorneys.

X Q. 106. And that is the first conversation you now recall that you had with anyone on this particular subject?

A. Outside of my wife and, for instance, my immediate family.

[fol. 150] X Q. 107. In plaintiff's Exhibit C, in which your figure appears, the pipe for carrying the cement is supported, apparently, in a lattice-like structure. I wish you would tell what the material is of that support. Is it iron, or wood?

A. It is iron; channel iron, and little flat bars of steel riveted together.

X Q. 108. When did you first see such a lattice-like structure for supporting a cement pipe?

A. It is my own ideas and construction; I built it there on the job.

X Q. 109. You built it there at San Diego?

A. I built it there in San Diego, in the foundation of the Timken Building; we had a forge for blacksmithing, press drills, and men who were able to do smithing work, and I personally helped to construct and build and place the boom pole, I called it, in such manner that I could carry my round pipe inside of the boom, leaving the boom flat on top, that man could go up and down on the top of that boom and the tower down to the point of that boom, and feel perfectly safe at the time of pouring concrete, to make any adjustments that might be necessary in connection with the work.

X Q. 110. Were there other photographs of that apparatus taken, to your knowledge?

A. I have taken photographs of the building from the beginning of the work clean through the work, but that is the only one that I have at the present time. I have generally taken it more of the building, to show the progress I was making, on my regular reports.

X Q. 111. Then this is the only photograph of the progress of the work on that building that you now know of; you couldn't produce another view, another showing——

[fol. 151] A. Not of the progress. I have taken various photographs of the progress of the work, but this is the only one that I have showing the apparatus which is in pouring the concrete of the roof of this building.

X Q. 112. If the other photographs you took of the progress of the work are accessible, I wish you would produce them, so that I might look them over.

A. Yes, I have those.

X Q. 113. Did you have to do with the construction of the Lukenback Building in Los Angeles?

A. No.

X Q. 114. Do you know who did superintend that?

A. I don't know as I can recall that. I don't know whether it was Malmgreen, Charley Malmgreen, or Johnson. I wouldn't be positive which; either one or the other; but I couldn't state. I knew them, but it is a long time ago, and I can't recall.

X Q. 115. Did you have to do with the work on the Elks Club?

A. No.

X Q. 116. Did you see the work while it was in progress?

A. I may have seen it, but I can't recall any details of it.

X Q. 117. You don't recall whether it had a gravity system for distributing the cement?

A. I couldn't say as to that.

X Q. 118. Did you ever meet Curt O. Wetzel in connection with the work on the Majestic Theatre Building?

A. Mr. Wetzel, I believe, was connected with the F. O. Engstrum Company in the sheet metal department, if I mistake not, and I met Mr. Wetzel frequently.

[fol. 152] X Q. 119. Did he help you to plan anything?

A. He would carry out instructions of making the pipe or iron or whatever I would want; Mr. Wetzel would work with me in the carrying out of my plans for any shop work that I required, for any of that work.

X Q. 120. Is it not a fact that you talked with Mr. Wetzel about taking out a patent on the gravity system prior to the time when you talked with Mr. Bryson about it, as you were going to San Diego?

A. No, sir; I never talked with Mr. Wetzel concerning my patent ideas, at any time or in any manner.

X Q. 121. Don't you recall that he or somebody else, prior to the time you talked with Mr. Bryson, told you that there was nothing patentable about it?

A. No.

X Q. 122. Now, are we to understand that you wish to be understood as saying that such details of your patent as are not shown in the structure of the Smith patent were first talked over by you with Mr. Bryson, as you have stated, about the time you were going to San Diego to do work on the Timken Building?

Mr. Mead: The question is objected to on the ground that it is an absolute misstatement of the previous testimony of this witness. The witness having previously testified that he disclosed the result of his structure to Mr. Bryson prior to the time of his employment by the F. O. Engstrom Company, and just prior to the time he went to San Diego. The question is further objected to, insofar as it refers to the Smith patent, on the grounds shown therein, as an improper cross-examination.

(Question read to witness.)

[Std. 133] A. I believe that I have fully stated the purpose of the trip, and I have talked with no one, or given any ideas, as to a patent, in any form or manner, only to Mr. Bryson, and I will say that what I had in my application fully set forth the purpose and principles shown in that Smith patent.

X Q. 123. You were in interference, were you not, with an application of Theodore Eastman?

Mr. Mead: Question objected to as not proper cross-examination.

A. I was notified by my attorneys in Washington of an interference suit by one Theodore Eastman, of Los Angeles.

X Q. 124. Did that surprise you, to receive such a notice?

A. Yes. I had been notified by a letter of my attorneys before I had gotten this notice of interference, of both Smith and Eastman, that my patent had been allowed, but it was not forwarded to me until after disposing of the interference suit, which I believe was done by compromise with me, and agreeing for the patent to be allowed along the line of understanding together, the best I recall.

X Q. 125. What negotiations did you have with reference to assigning this patent to the Concrete Appliance Company? And also did such negotiations take place?

Mr. Mead: Objected to as immaterial, and not proper cross-examination.

A. Oh, it was some time after the issuance, or about the issuance of the patent, just about. I will not be positive as to that. I had no [Std. 134] conversation, or conversations with Mr. Bryson exactly, in the future, as would have our personal understanding as to by transfer of letters patent might be issued to us, or had been made by which I had taken Mr. Bryson as a man of confidence of our future attainments, that I agreed for the patent to be used, or whatever proceeding was necessary, of closing the suits before the Patent Commission.

Q. (120) And with that understanding, you assembled in Smith's [illegible] third and fourth times, did you not?

Mr. Read: Objected to as not proper cross-examination and as calling for evidence which is not his best evidence.

A. I agreed that [illegible] might be assumed as the intervention, while I felt that I was required upon [illegible] to be there as the interference ends. That the rights of parties might not be killed in its influence or beginning, and that if Mr. Brown and his associates felt that by letting the lessee remain in [illegible] or the papers on, in other words, the note [illegible] further interference, that I would agree to such understanding.

Q. (121) And do I understand you correctly in stating to Messrs. Read Mr. Brown and that if I were at right to such interference would you [illegible] or take care of you, as a good?

Mr. Read: Question objected to as irrelevant and immaterial.

A. Of course, that was a personal matter between Mr. Brown and myself, as to what we considered proper compensation.

(Adj. 12:01) Q. (122) Now in that way you consider yourself personally interested in the outcome of this suit, do you not?

A. I have no personal feelings in the circumstances, other than to make a clear, plain statement as I appeared to me from time to time, any more than I like to see the [illegible] in question. My personal matters were settled for in the early stages of the [illegible] have transferred over. I have had no interest whatever in the action, or outcome since that.

Q. (123) During those negotiations with Mr. Brown, did he mention the fact that Theodore Swenson had an application pending?

A. If Mr. Brown had ever spoken to me of Mr. Swenson you among his papers or his [illegible] to any account. I don't recall it.

Q. (124) I have before me a paper which purports to be a copy of a preliminary statement of Lee Christian to a certain [illegible] No. 10,[illegible] Christian v. Swenson v. Smith. This purports to have been subscribed to and sworn to by him the 4th of August, 1908, before [illegible] Notary Public. I will ask you if you recall in connection with any of your conversations with Mr. Brown, or otherwise, any reference to such a preliminary statement?

Mr. Read: In view of the fact that the paper to which reference has been made in the preceding question [illegible] is not in evidence, I will in any way identified, except by statement of counsel, and it is not entitled, the question is objected to as wholly improper, incompetent, immaterial and incompetent.

(Adj. 12:01) Mr. Brown: In order that statement of counsel [illegible] may not be misunderstood, I will interpose to his last that his paper shows his name "Lee Christian" in the place of his own name.

Mr. Hood: The words "Lee Callahan," as well as the words "C. T. Hirst," are in typewriting, and quite apparently the same typewriter as the rest of the paper. There is absolutely nothing on this paper to show its authenticity, or the correctness of its statements. It is wholly improper as the basis for examination.

Mr. Barton: My question spoke of it as a copy only. I am assuming that a certified copy may be obtained, and am accordingly referring to this copy de bene esse.

Mr. Hood: There is nothing on the paper itself to show that it is in fact a "copy" of anything. Counsel for plaintiff have no objection to the offer of a certified copy of any preliminary statement which this witness may have made, and to an examination based thereon, although apparently it would be outside of the direct examination, and, therefore, not proper cross-examination. But as there is nothing at hand at the present time by which the authenticity of this alleged "copy" may be determined, it is insisted that the proposed question is wholly improper.

A. Not that I recall.

X Q. 131. Do you recall making or swearing to any preliminary statement in connection with either this interference No. 30,533, or the one between you and Emtman, the latter of which, as I am informed, involves the claims of your patent in suit Nos. 1, 2, 5 and 13.

[fol. 157] Mr. Hood: The question is objected to first as assuming matters not proven by the record, and secondly, as indefinite, on the ground that it does not appear that this witness knows the technical meaning of the phrase "preliminary statement," the meaning of which is highly technical. The question is also objected to as not proper cross-examination.

A. I recall, at the time that I was notified by my attorneys of the interferences, of calling my attention to certain features or numbers as the interference suit brought by Emtman and Smith, and forwarded immediately, without consulting Mr. Bryson or anyone else, but I felt it was the proper information for my attorneys to proceed with, and if the last question asked me is of that purport, I filed an answer or statement of what the requests and requirements of my attorneys were.

X Q. 132. Did you file two such statements, do you remember—one in each interference?

Mr. Hood: The question is objected to as immaterial.

A. I don't think that I made any—well, I won't be positive as to the statement, but I don't think I was requested or required, the best I recall, for further statement than the information that I gave to my attorneys.

X Q. 133. And did they send back a paper or statement in which they had put in shape what you told them, and did you sign that and swear to it before a Notary Public?

A. Any statements, papers, or documents, drawing, or what might be requested by my attorneys, I always executed as per their request, to make them efficient.

[fol. 158] X. Q. 134. And it is your belief that you did swear to such a paper, and return it to your attorneys?

A. Any request that was made by my attorneys, I answered accordingly.

X Q. 135. Yes; but, specifically, you believe, do you not, that you did sign and swear to such a paper as I have described?

Mr. Hood: This line of examination is objected to as wholly incompetent, in addition to the reasons already disclosed, and also, in the absence of anything being shown to be any properly certified copy of paper or alleged paper being shown to the witness.

A. No doubt I subscribed to papers along that line, but as to that specific paper that is there, I don't know of; but if it was required of me, whatever papers were presented me at that time, I subscribed and swore to it and identified it in a legal way as requested by the attorneys; whatever dates that may have been; what that may have been, I can't recall; it is a long time.

X Q. 136. I understand that you took out a patent in the Dominion of Canada, No. 144,246, dated November 19th, 1912, for material-transferring apparatus, and that in that Canadian patent the same claims are found that are found in the patent in suit; also that there was a suit in the Supreme Court of British Columbia between Concrete Appliance Company, plaintiff, and W. K. Rourke, J. McDonald, and R. Moncrieff, carrying on business as general contractors at Vancouver, B. C., under the firm name and style of Rourke, McDonald and Moncrieff, and the said firm of Rourke, McDonald and Moncrieff and Mussens, Limited, defendants; and that you [fol. 159] gave a deposition for the plaintiff in said case in December, 1914, before I. Benjamin, Notary Public, etcetera. Will you state if such are the facts?

A. As to the letters patent, there was a patent issued in Canada, and the suit mentioned was on infringement, and I gave testimony in open court, and not by deposition.

X Q. 137. Don't you recall that Frederick S. Lyon conducted your examination at Los Angeles, and that you were cross-examined by Mr. Anderson, of Anderson & Anderson?

A. I remember, or the best I can recall, of making a statement before Mr. Lyon, but just when that was, or its purpose, at that time, I can't fully recall.

X Q. 138. I show you a photograph, on the back of it being marked in pencil, "Insley apparatus shown in photo;" and at the bottom on the back of the photograph appears "April-1913, Hudson Bay Co. Building, Vancouver, B. C." I will ask you if you have seen that photograph before, or a duplicate of it, and if so, when and where?

Mr. Hood: Objected to as irrelevant and immaterial.

A. I may have seen this photograph in Vancouver, about 1914, when I was examined in that interference in Canada, but I have no special marks of identity other than just a faint recall of such.

X Q. 139. Do you consider that that photograph shows what you consider your gravity system?

Mr. Hood: Objected to as incompetent.

A. Yes.

X Q. 140. Would you give a general description of the gravity system as it is shown in that photograph?

Mr. Hood: The question is objected to as wholly improper and not cross-examination; no foundation has been laid to connect the [fol. 160] apparatus shown in this photograph with the issues involved in the present case, and so far as any apparent date is concerned, it seems to be long subsequent to the patent in suit. Counsel for plaintiff protests against padding the record with matters of this kind, in the absence of any showing connecting the structure shown in this photograph with either of the parties to the present cause.

A. I can describe here of troughs and receiving pans, I would call it, and receiving hoppers, such as are being generally used now in concrete work.

X Q. 141. What is the purpose of the beam that projects to the left about centrally of the picture?

Mr. Hood: Question objected to as not proper cross-examination, and as relating to a matter having no proper foundation in the present record.

A. That boom that you have reference to impresses me only as a construction boom used singly and separately from concrete work, like the seat of one that appears in the diagonal corner which is handled in a different direction, which leads me to believe that is what is used altogether, and not in connection with concrete, only as a boom only to lift other materials with.

X Q. 142. You mean just such booms as had been used for many, many years in the construction of buildings?

Mr. Hood: Question objected to as not proper cross-examination, and because based upon a photograph which has not been properly identified or proven.

A. Yes. That might have been possible.

[fol. 161] X Q. 143. How are the cement pipes or troughs in that photograph represented as supported and handled?

Mr. Hood: Question objected to as not proper cross-examination.

A. The pipes as shown in the photograph show to have been braced by truss or stay rods underneath of the pipe, which would tend to stiffen the pipe as would a boom pole used for like purpose. It seems to be controlled, and operated, with rope and tackle, and is transferring your concrete from your receiving hopper over into some other little receiving pan of a like constructed pipe, and vice versa, until the concrete is distributed in place. That is as it appears to me.

X Q. 144. Did you have any such photograph or a description of such apparatus as is shown in the photograph before you when you gave testimony, as you say, in open court, at Vancouver, B. C.?

A. There was a number, as I recall it, of photographs. It may have been presented to me during my testimony in Vancouver.

X Q. 145. And is it a fact that this photograph represents in substance the structure that was made by the defendants, and that was claimed as an infringement of your Canadian patent, to which I have referred?

A. As I recall, it does. Of course, I was shown many photographs in giving my evidence, at that time.

X Q. 146. And what difference, if any, in the mode of operation in the process or function of the apparatus does the use of such cable type of boom effect, if substituted for the particular type or construction of boom shown in the drawings of your patent here in [fol. 162] suit, and as particularly pointed out in claims 1, 2, 5 and 13, to which I now call your attention?

Mr. Hood: The question is objected to as based upon a structure not fully disclosed, and as indefinite.

A. There is not much difference whether you operate with a cable or a boom, so you can have an oscillating boom in your pipe line, which causes an even flow or distribution of your concrete. It can operate as well on a cable. A boom pole is merely to operate a whole line of apparatus economically and speedily over the heads of other workmen, in the other work or process of construction. Cable lines can be fixed to carry your concrete equally as well, but it is a fixed line. Those fixed lines at the end of the main line—there we attach a movable joint for a short distribution; but the principle of operating and pouring over a boom pole, and a cable line, gets the same results of the concrete.

X Q. 147. Does it change in any way the mode of operation or principle of the device?

Mr. Hood: The question is objected to as indefinite, and as based upon an incomplete disclosure not properly proven or identified.

A. No, not the principle.

X Q. 148. In the device of this photograph, what element in the apparatus is supported by this cable boom to which you have referred?

Mr. Hood: Question objected to as not proper cross-examination, [fol. 163] and also on the ground that the witness has not referred, in his discussion of this photograph, to any "cable boom."

A. I don't see any boom at all; it is only the fixed pipe. It seems to be held in place by a cable, or a block and tackle with ropes, and seems to be fixed, at fixed points, with the exception of the lower or the bottom section where the men is operating just the level of pouring their concrete. It seems for any further adjustment, it would

be to loose these stiff joints and make them stationary again; as to the reference of this photograph.

X Q. 149. I will quote what purports to be a question and answer in the deposition I have referred to as given by yourself:

"Q. 21. Does it change in any way the mode of operation or principle of the device?

"A. The principle would be the same whether on a cable or on an oscillating boom. I frequently use it myself on cables for convenience, when I drop a boom. For instance, in steel frames, if I want to fireproof, I have a system of cables where I stretch my devices on and make a leading line, and at the end of it for distributing purposes I work identically the same as if it was on a boom. I pretty near as often use a cable line even when I am using the boom, for many conveniences, rather than by moving the boom in operation. It is the same principle."

I call your attention also, in this connection, to the fact that X Q. 146 is quoted from the said deposition, and is the statement of Mr. Lyon, except that at the end Mr. Lyon refers to your Canadian patent, and I refer to your United States patent in suit.

Mr. Hood: The question is objected to as assuming facts which have not been proven; also as not proper cross-examination; and also [fol. 164] because there is no showing that at the time of the alleged deposition the witness had before him the particular photograph which is now being used as a basis for the question.

X Q. 146 (continued). Would you testify in the same way at the present time?

A. Yes; I presume I would, as far as I understand it.

(Thereupon an adjournment was had until Saturday morning, March 12, 1921, at ten o'clock A. M.)

Los Angeles, California,
March 12, 1921—1:30 p. m.

(Met pursuant to adjournment. Same counsel present.)

LEE CALLAHAN, recalled.

Cross-examination resumed by Mr. Barton:

X Q. 147. Can you fix the date accurately as to the time of your arrival in Los Angeles?

A. You mean my first arrival here?

X Q. 148. Yes.

A. I think, the best I recall, was about the 26th day of November; that is the best I can recall, somewhere about that time, in 1907.

X Q. 149. You have no original entry or memorandum that would aid your memory?

A. Not that I know of. Just as I recall, it was somewhere about that time, the latter part of November, about that date. I know we was speaking about it, me and my wife, the other evening, with the [fol. 165] children, we was recalling the time; somewhere around the 26th of November; I am pretty sure it was that time.

X Q. 150. Can you fix the actual date of your first meeting Mr. Bryson?

A. No; I couldn't fix the exact date, but it wasn't but a few days after I came to Los Angeles. As I have previously stated, a few days; in looking around for a job, I met Mr. Bryson; the exact date I couldn't place, but it was only a few days.

X Q. 151. How many minutes did you talk with Mr. Bryson at the first interview?

A. To go back in memory 12 years back, it is pretty hard to say; we had a casual conversation, as an ordinary business man would, in the making our introduction, I would say; and after a brief talk, Mr. Bryson suggested we would meet again in the next day or such a matter; and in a day or such a matter after that I met with Mr. Bryson, and I had with me a set of blueprints of a considerable sized apartment building that I had prepared before coming to California. This only was to give information to Mr. Bryson that I had an understanding of considerable-sized work. At this meeting we had quite a little conversation, which culminated in Mr. Bryson stating he would give me a position.

X Q. 152. Was that second interview of a period of as much as 15 minutes?

A. Well, as I recall, we must have talked three-quarters of an hour to an hour; just as I can recall. We had a considerable conversation; he looked through my plans, and we talked over them; then we went on into his business, and in looking and trying to secure for myself a position.

[fol. 166] X Q. 153. When next did you see Mr. Bryson?

A. Well, I didn't see Mr. Bryson for a few days; I can't just state what; just before Christmas. It had been raining off and on quite a little, and just moved in, me and my family was getting located; setting up the housekeeping, and arranging to get the babies to school. So at the next meeting with Mr. Bryson he told me to come to work, that was a day or such a matter before Christmas; and he said, being it's Christmas, we will go to work the day after; that is why I fix the date in my mind as clear as I did, the date of starting to work; the day after Christmas. So the day after Christmas, of 1907, I went to work as previously stated, and set forth for the F. O. Engstrum Company.

X Q. 154. What was your actual work the first day of your service, that is, when you went on the pay roll?

A. I believe, the best I recall, the first day of the service I was given charge of a few men, and began to erect the erection of forms for the concrete.

X Q. 155. What did you do the second day?

A. The second day I began to arrange for the placing of a mixer,

digging a pit for a tower, placing an electric hoist suitable for the order of work as I have previously stated in this evidence.

X Q. 156. The third day, what did you do?

A. It was a continuation of the work in preparation for the pouring of concrete on this Majestic Theatre building.

X Q. 157. You don't know the exact day when you began pouring concrete, I understand?

A. As I was stating, stated previously, it was only a few days, I believe around the 1st, about the 1st day of January, 1908.

[fol. 167] X Q. 158. You have no time book or diary that enables you to positively fix the date, I understand?

A. I think not; but it is about that date.

X Q. 159. Do you not now recall showing Plaintiff's Exhibit "B" to anyone except Mr. Bryson at any time?

A. Not prior to my letters application of patent, not that I recall.

X Q. 160. Did you aim to keep the construction secret, that is, not to publish it generally?

A. I didn't intend to publish it generally, until after I had secured letters patent, sufficient that I couldn't be robbed of it. Naturally I intended to put it to the public after having protective rights, as I felt I was entitled to from the Patent Commissioners of the United States of America.

X Q. 161. Did anyone advise you to keep it secret, that is keep it to yourself so far as you could?

A. I had no advice from anyone, other than my own ideas about it.

X Q. 162. Have you seen or have you in your possession any advertisement, catalog, or other printed publication of the F. O. Engstrum Company, in which are shown views of the Majestic Theatre Building and other buildings that you superintended?

A. I believe I have.

X Q. 163. Have you such a publication as is accessible to you?

A. I believe I have some at my residence; I won't be positive, but I have quite a lot of photographs principally that the Engstrum Company have done, that I have taken views of, and I believe I have a little book written up on concrete appliances, or something to that effect, showing little views of buildings I am not sure, but [fol. 168] I think it shows the Majestic and the Timken Building, and other buildings that have been constructed by the Engstrum Company with this apparatus system previously described.

X Q. 164. You have sent to your house for photographs of the Engstrum work; while we are waiting for them, I wish you would state if you have any original drawings, sketches, or description of any part or portion of the structure set forth in your patent, of an earlier date than Defendant's Exhibit B?

A. I don't think so.

X Q. 165. You have no rough sketch or writing or other item or paper showing any part or portion of what is showin in Plaintiff's Exhibit B, prior to Exhibit B?

A. Prior to what I have previously stated, such rough sketches

that I prepared for the work of the erecting of equipment in connection with the Majestic Theatre, this work being improved upon, the sketches that I made for this first work; the sketches we speak of here has been improved along those lines with a view of submitting, as I have previously stated, to my attorneys for a search of right of patentability.

X Q. 166. This Exhibit B, then, is the earliest sketch that you now have in your possession the others were not preserved?

A. That is right.

X Q. 167. And I have understood you to say that Mr. Bryson is the only one to whom you showed this Exhibit B, prior to your sending it to your Washington attorneys?

Mr. Hood: The question is objected to as containing a statement contrary to the direct examination of the witness, the witness [fol. 169] having testified on direct examination that this particular drawing was shown to the draftsmen, Reger, for the preparation of Plaintiff's Exhibit D.

A. As I have previously stated, I did not fully reveal my ideas of the system to other than Mr. Bryson before mentioned, until a later date I explained in pencil sketch and in person, as previously stated, to one Mr. Carl Reger, who was a draftsman, to do my tracing of the tracing sheet as I have presented here.

X Q. 168. Yesterday you had before you the Smith patent, and particularly his claims 1, 3 and 4. I will ask you, partly in repetition, this question: If the structure described by the language of said claims 1, 3 and 4 was old at the time you made your change or improvement, what do you consider to have been the specific change or improvement which you made? What, if anything, did you add to what is described in those claims of Smith? I place the Smith patent before you.

Mr. Hood: The question is objected to as not proper cross-examination, no direct questions having been asked the witness relative to the Smith patent. The question is further objected to as incompetent, in that it calls for an expression of opinion, and the witness is instructed to decline to answer the question until ordered so to do by the proper court.

A. I will state I believe I fully answered in my previous examination to a conclusion of this question.

X Q. 169. I will read from a paper which purports to be a copy [fol. 170] of a preliminary statement filed by you in Interference No. 30,533, as follows: "That he made a full and complete apparatus, beginning with the 18th of September, 1908, and completed the same on the 11th of October, 1908. That inasmuch as the apparatus was then complete and successfully operated, he considers that he reduced his invention to actual practice not later than October 11th, 1908." Do you recall having made, in substance, the statement which I have thus quoted?

Mr. Hood: The question is objected to as calling for a statement of conclusion.

A. I only recall, in substance, as previously stated, in the submissions of my drawings and case submitted to my attorneys. Such statements as I have previously stated at such dates as the records may show, or show, I made in compliance with my counsel at that time.

X Q. 170. I show you Defendants' Exhibit 40, photographs of specific structures. There appear six photographs fastened together. State if you recognize these photographs as taken from any structures or work with which you were familiar.

Mr. Hood: The question is objected to as not proper cross-examination, and as relating to exhibits of defendants which have not been properly proven.

A. I had not the supervision of any of these buildings shown in the photographs. I am not familiar with these buildings, or the buildings from which these photographs were taken.

X Q. 171. Is it correct to say that you first used the structure of your patent in suit as a completed apparatus upon the Timken Building at San Diego?

[fol. 171] A. My statement previously that I had a complete apparatus in the construction of the Majestic Theatre Building, and I made minor details or improvements on parts of equipment which entered into the completed apparatus as I applied in use on the Tinken Building, and for use in the application for a letters patent.

X Q. 172. Your deposition given in the case in the Supreme Court of British Columbia seems to have been given in December of 1914. From your cross-examination in that case, as it appears in the copy which I hold, I will read as follows:

"X Q. 31. Assuming for the purposes of the deposition, that the application for the patent No. 144,246 about which we have been talking, was filed February 7th, 1911. Had you, prior to that time, used this apparatus as a completed whole?

A. I had used it.

X Q. 32. You had prior to that time?

A. Yes; and was using it at the time I made my application.

X Q. 33. How long prior to that time had you been so using it as a completed apparatus?

A. Oh, I had been using it, I presume, a year or something like that. I could not be exact.

X Q. 34. Had you been using it in the construction of buildings?

A. Yes, sir; I was using it at the time in the construction of buildings.

X Q. 35. On what building did you first use it as a completed apparatus?

A. It was the Timken Building, I believe, at San Diego, California.

[fol. 172] X Q. 36. When did you first use the apparatus as a completed whole on that building?

A. I thought I just answered your question. I was using it on that building. The exact time prior to the filing, I could not tell you, but I started in with the building a little better than five years ago.

X Q. 37. Then you first used the apparatus as a completed whole on the Timken Building in San Diego, California, when that building was first started, whatever that date may have been?

A. I started that building and used that as a completed apparatus on that, but I had used it in part prior to that on other work.

X Q. 39. How long prior to that?

A. Just to give the exact time, I would have to get records.

X Q. 40. Approximately?

A. Approximately a year."

Do you recall testifying as appears in this quoted matter, and if so, were the statements true?

Mr. Hood: The question is objected to as having no proper foundation in the record.

A. In answer to the question, of the Vancouver statement, I believe the question had reference to a deposition that was taken by me. My statements that I made in 1914, as I previously stated, I believe was in open court, and such statements as I made at that time was correct to the best of my knowledge and understanding.

X Q. 173. Do you not recall giving a deposition at room 503, [fol. 173] Merchants Trust Building, Los Angeles, in December, 1914, during which questions were asked you by Mr. Frederick S. Lyon, and by Mr. W. H. Anderson?

A. I believe I answered in my previous examination here of making a deposition in Mr. Lyon's office; the date I can't recall, or at this time recall his purpose of the deposition, but it was concerning this patent in question.

X Q. 174. And you believe it was about December, 1914?

A. Probably it was along that time; I couldn't state the time, having no interests in the case; I didn't endeavor to fix dates on it.

X Q. 175. The quotation in my X Q. 172 is taken from what purports to be your deposition taken in Mr. Lyon's office, and I will ask you again to look over the quotation and state whether what you said then, or appear to have said then, was a correct statement of facts, to the best of your knowledge and belief?

Mr. Hood: The question is objected to as assuming a fact which has not been proven in this record.

A. Those statements are true, to the best of my knowledge.

X Q. 176. And you have carefully read over the quoted matter and understand it, have you?

A. I believe I understand it, to the best of my knowledge.

X Q. 177. I continue the quotation as follows:

"X Q. 41. What portions had you used?

A. Well, I had used part by making swivel devices of pipe and

tried it in a small way on work as to whether it would prove my claims for it.

[fol. 174] X Q. 42. What portions had you used in that way according to your best recollection, prior to the work on the Timkin Block?

A. I had used these receiving bins, discharging bins, these little swivels, the principles that make up the completed system as we have been working on it ever since, or using it, I mean.

X Q. 43. When, for example, did you first use the tower for the purpose of distribution?

A. I could not get that definitely.

X Q. 44. With reference to the Timkin Building, was it before or after?

A. I had used it prior to the Timkin Building. I had used the tower principle for a couple of years, or possibly three years prior to the Timkin Building. I have used the tower further back than that, but not as a completed principle with this. But that was leading me to the making up of these principles."

Please read over this quoted matter and state whether what you appear to have said at that time was correct.

Mr. Hood: Question objected to on the ground that the necessary context has not been quoted.

A. To recall what I said at that time, I can't recall it. It has been quite a while since I made the statement, and whether I know whether I was interrogated on other work I could not state,—together with this line of interrogation,—at that time. The best I recall, I was called to Mr. Lyon's office and was briefly interviewed on something pertaining, as best I can recall it, as previously stated, and [fol. 175] what statements, the best I can recall, at the time, I endeavored to give a correct understanding or statement; as I recall it, only a brief interview.

X Q. 178. And would you now wish to modify your answers which appear in the quoted matter?

A. Possibly it would be better that I would illustrate at this time along such lines that I might have concluded such statement. In the mention of using a tower, or construction for such work, would be for a brick hoist, means of hoisting up brick over the tower, or something along that line; but it was not for the purpose of concrete construction work. And I would prefer, if that is the inference of this purported interview, to correct that. It led my ideas which I believed at the time I was conveying to a fact fixed in my mind, that I could, when opportunity presented itself to me sufficient, through an apparatus in my mind for the handling of concrete construction, that I could use it, by making mechanical equipment or receptacles by which to convey my material to higher elevations in what I termed the superstructure or a completed building in its entirety of concrete construction, and as I have previously stated. I did not have the opportunity of fully developing this purpose and

apparatus until 1907, after interviewing with Mr. Hugh W. Bryson, of the F. O. Engstrum Company, in the city of Los Angeles, California, who was willing to finance and give me a free hand to fully develop these ideas. Now, if any deposition that has been taken in question is other than this, I wish to modify it.

X Q. 179. The specific question I put to you was as to whether the statements quoted and purporting to be your testimony, accord-
[fol. 176] ing to your present knowledge and memory, are correct in substance?

A. I would say yes.

Mr. Barton: Cross-examination closed.

Cross-examination closed.

Redirect examination (without waiving objections stated to questions on cross-examination).

By Mr. Hood:

R. D. Q. 180. Mr. Callahan, did you notice that in the Smith patent, to which your attention was called on cross-examination, it is proposed to mount the tower structure and the hoisting apparatus, that is, the motor, on a platform which was to be supported on a turntable, so that the whole tower could be rotated around its vertical axis?

A. I noticed in the drawing of the letters patent here presented to me, as described, to be a platform with a tower, means of hoisting, and mixer, to be on the platform, as it may be rotated, or in other words, turned or revolve around.

R. D. Q. 181. Do you think that that would be a practical construction?

Mr. Barton: This being an expert question, it is submitted that statements should not be put into the mouth of the witness.

A. I would not.

R. D. Q. 182. In your cross-examination, in answer to X Q. 110, it would seem that this answer might be construed as a statement that you had taken photographs of the Timken Building apparatus [fol. 177] from the beginning of the work. Have you any photographs now in your possession other than Exhibit C, of the Timken Building apparatus?

A. As I have previously stated, this is the only photograph that I have of the apparatus in question. The other photographs I have is of the building under course of its construction, as I have previously stated, and of the finished building, but not showing the apparatus.

R. D. Q. 183. Did you take any photographs at all of the Majestic Building, or the apparatus which you say you used in the construction of that building?

A. As previously stated, I had taken no photographs of the Majestic Theatre Building, or of apparatus.

R. D. Q. 184. You have had quoted to you, in X Q. 169, a certain statement which it was said you made in a preliminary statement in connection with Interference No. 30,533, to the effect that you completed a certain apparatus about the 11th of October, 1908, and that you began the building of this apparatus the 18th of September, 1908. What apparatus was it that you had in mind when you made that statement which you made?

A. In speaking of the apparatus, as I have endeavored to demonstrate to you conclusively, was completed at the Majestic Theatre Building, and minor details of mechanical equipment or purpose in more fully developing of the apparatus, that is, mechanical, understand me, construction of equipment and parts of equipment; but I would repeat that the completed system, in its purpose, was perfected on the Majestic Theatre, and this work that I have previously spoken of doing and applying this method of handling concrete at the later dates was given in pursuance, and as the records will show, [fol. 178] for application of letters patent; but, I will repeat again, the completed system for this work was on the Majestic Theatre, down during the early part of 1908; as stated, I commenced the work of fully developing the equipment to carry out, which proved to a success the handling of concrete for superstructure of work.

R. D. Q. 185. And what particular apparatus did you mean to indicate as having been begun in September, 1908?

A. That is the apparatus—I wish to make this clear to you, if I can—were in parts of various mechanical makeup that I may have improved on in the way of mechanical, we will say, a pan, or some special little device in varied forms that practiced along our line of work, for instance, on the Timken Building, where I could pick up improvements over the first work, what the equipment might be. At times the varied orders of your material would necessitate the changing of the order of a certain piece or device, or method for operation. That, in my statement, that was in question, may be what I termed in kind of an explanatory way of finishing, but the system and equipment first spoken of was the original and completed system first carried out and developed by me.

R. D. Q. 186. In the portion of your alleged deposition in the British Columbia case which comprised X Q. 31 and your answer, your attention was called to the fact that the Canadian patent in suit there was based on an application which was filed February 7, 1911, and you stated in your answer to X Q. 33, apparently, so far as the quoted matter is concerned, that you had used the completed apparatus about a year prior to that date, that is, about a year prior to February 7, 1911. At the time you were answering that question, did you have in mind the filing date, February 7, 1911, of [fol. 179] your Canadian application, or the filing date of your United States patent?

A. I can't recall at this time, correctly, I believe, the letters patent which I applied for, and was allowed, and after the transfer of my rights and title to Mr. Bryson previously mentioned, in this case,

the application applied for in the Canadian right was applied for by and through other parties than myself, but approved of by me for application, the best I recall it. That was applied for through and from a letters patent that had been granted me in the United States.

R. D. Q. 187. Then you meant that you had had the apparatus in use about a year prior to the time you filed your application in the United States, that filing being January 21st, 1909. Was that right?

A. I wish to state, and if possible to make clear to the counsel on both sides of this case, at the present time, that I had used continuously this apparatus as previously stated on the Majestic Theatre Building from that date on down irrespective of the applications that I was making; so as to make it clear.

R. D. Q. 188. And that you used that apparatus on the Majestic Theatre Building very close to the 1st of January, 1908?

A. Yes. I will state again that it was only a matter, as previously stated, of just a day or so, or a few days, it had only taken a short time to place the equipment and the tower, our forms being in place, for the operation and pouring of concrete, it was either, as I can recall, about the last day of December, 1907, or January 1, or not later than 2. I will place it; I will have to have the records to be exact, but I can recall the time, I can recall that everybody con- [fol. 180] nected with the work was very anxious to see the results that I proposed to develop, and I was bending every effort to make good of my assertion that I had set forth in the interview with Mr. Bryson previously referred to of what I could accomplish. And it was not later than January 2nd, but I believe, since reflecting in my mind, that it was about—I will say January 1; either the last of December or the 1st day, I will place it; that is the best I can recall it. and I am quite positive.

R. D. Q. 189. At the time you were supposed to have given this deposition from which Mr. Barton has quoted certain parts, had you had an opportunity to check up any records which would give you the approximate time when the Majestic Theatre apparatus was built and put into use by you? I mean, back in December, 1914, when you say you had this cursory conference with Mr. Lyon.

Mr. Barton: Attention is called to the fact that this plaintiffs' witness, and a witness in position to be quite interested, if not a partisan for plaintiffs—the leading character of the question is accordingly objected to.

A. I had no opportunity; in fact, as I recall it, I was called over the telephone by Mr. Bryson to see him at Mr. Lyon's office, and when I got there he had some little notes—or talk over some little notes, and he asked me if I would give a statement or something concerning the gravity system.

Redirect examination closed.

[fol. 181] Recross-examination by Mr. Barton:

R. X Q. 190. Claim 2 of the Smith patent referred to reads as follows: "In a device for distributing concrete, means for elevating the concrete to a point above the plane of the work to be performed; a hopper adapted to receive the concrete so elevated; a primary distributing pipe revolubly mounted beneath the hopper; a secondary distributing pipe revolubly mounted beneath the mouth of the first-named distributing pipe, and means for controlling the flow of concrete from the hopper to the first-named distributing pipe, substantially as described." As a description of a mechanism, do you understand it?

Mr. Hood: Question objected to as not proper recross-examination.

A. Yes.

Mr. Barton: The photograph referred to by this witness as marked—The photograph referred to in X Q. 138 is offered in evidence as Defendants' Exhibit, Photograph Hudson Bay Company Building, Vancouver, B. C., No. 45.

Mr. Hood: The exhibit is objected to on the ground that it has not been properly proven; and that it is irrelevant and immaterial.

Redirect examination, without waiving objection, by Mr. Hood:

R. D. Q. 191. Mr. Callahan, in this photograph, Exhibit No. 45, the first trussed chute section, that is, the uppermost chute section, which appears at about the middle of the photograph, appears to be [fol. 182] supported at its lower end by block and tackle, which extends upwardly toward the right. There is no connection between the lower end of this first chute section and the tower which carries the hopper, is there?

A. There is not.

R. D. Q. 192. Apparently both the upper trussed chute section and the second trussed pipe appear to be supported at their lower end by block and tackle which are apparently suspended from the independent tower structure at the right hand side of the photograph. Is that right?

A. That is correct.

R. D. Q. 193. Do you think that an apparatus of this kind, in which an independent tower structure is provided for supporting the block and tackle which I have mentioned, is as good an arrangement as one in which the chute sections are suspended entirely from the other tower in which the hoist skip is mounted and upon which the hopper is supported?

A. Why, it is very clearly and distinctly to be perceived, even from a lay mind, of ordinary understanding, around a building, that to have a second tower for the means of controlling a pipe line system, or any other system for pouring concrete, which is only in a fixed way from one point of distribution to another, when you could have your equipment in a practical way that you could revolve

it or oscillate it and turn it so as to distribute your materials in any and varied parts so desired to be reached, of your work. And it is not practical, as I have stated.

Mr. Hood: That is all.

[fol. 183] Recross-examination by Mr. Barton:

R. X Q. 194. In answer to X Q. 146 you said, "There is not much difference whether you operate with a cable or boom, so you can have an oscillating boom in your pipe line, which causes an even flow or distribution of your concrete. It can operate as well on a cable" * * * and so forth. I show you this entire answer to X Q. 146 and ask you if you wish to modify it in any way.

A. In answer of this question, the reference that I have or had in this previous statement of fixed lines, in carrying concrete on a cable of long reaches, where it would be too far to reach with a boom pole, but in all cases I have preferred, and wish to have it understood, to use the boom pole even up 110 feet in length for a more practical and speedier way of the progress of work; and I only used the cable or the fixed lines which we can carry the concrete with an oscillating movement the long distances which I have stated, of even to a distance of 500 feet from the operating tower. The concrete so carried or transferred, if it is properly controlled to the elbows or bends at the far ends of the outward end of our pipe lines, is so handled that the concrete is recollected in such plastic condition as to avoid segregation or separation, and I tried to make it clear to the counsel in question that the plastic consistency of the concrete is harder to obtain on the short leads of these pipes, and is not as practical; and you can't hold the proper plastic consistency as well as on the boom line or the principle of oscillation as I have tried to set forth previously.

[fol. 184] R. X Q. 195. Is it your position, then, that the apparatus shown in this photograph, Exhibit 45, does not contain what you consider your invention?

Mr. Hood: The question is objected to as incompetent, and the witness is instructed not to answer the same. No proof has been made of this photograph, and it is a question for the court to determine whether a particular apparatus "contains the invention."

Mr. Barton: The witness has already been asked by his counsel expert questions, and it is submitted that he may properly state what he considers is invention, and may also state properly whether he finds it, or thinks he finds it, in a given structure.

Mr. Hood: It is not competent even for an expert witness to express such opinions as have been called for, and the instruction not to answer is repeated, unless and until the court having jurisdiction of this witness requires the question to be answered.

A. I decline to answer, upon advice of counsel.

R. X Q. 196. Do you find in this photograph, Exhibit 45, a boom such as is shown in your patent?

Mr. Hood: Objected to as immaterial.

A. I have stated previously, it seems from the photograph upon the tower to the right it shows what purports to be a little boom pole, as well as I referred to on the diagonal corner, is still to the right as I hold this photograph, which seems to show the identical same seat or principle as shown on the first-mentioned to the left on the corner of the tower, as I am holding the photograph, only tends to my mind to show a construction boom or device that may be used, or [fol. 185] may have been used, for outside handling of materials separate and apart from the pipe line system or apparatus which has been in question, or is in question. I see no connection of the use of this boom other than has been commonly in any ordinary work.

R. X Q. 197. Then do you, or do you not, find in this photograph, such a boom as you show in your patent?

Mr. Hood: Objected to as immaterial.

A. I have used a similar little pole, boom pole, to stiffen or to carry for sections of my works, for instance, the Majestic Theatre building. This boom pole, or a like pole, can and has been used as any other boom pole that would be built, that you may call my attention to, in the lattice construction, like I used on the Timken Building. I also showed what I call a yard arm or round pole used there on the Timken Building, in the photograph which I have presented in evidence here.

Deposition closed.

Lee Callahan.

(Thereupon an adjournment was had until Monday, March 14, 1921, at 8:30 A. M., at the same place.)

Los Angeles, California,
Saturday, March 12, 1921—10:00 a. m.

(Met pursuant to adjournment. Same counsel present.)

Edward Anderson, a witness called on behalf of plaintiffs, having been first duly sworn, deposes and says as follows:

[fol. 186] Direct examination by Mr. Hood:

Q. 1. Please state your name, age, residence and occupation?

A. Edward Anderson; 1114 Hoover Street, Los Angeles, California; age, 71; occupation, carpenter.

Q. 2. Please state whether or not you ever did any work in connection with the erection of the public school building at Union and Cabanne Streets, St. Louis, Missouri.

A. Yes; I done foundation, concrete foundation, and fireproofing.

Q. 3. When was that building erected?

A. In 1906 and part of 1907.

Q. 4. Is that building generally known in St. Louis as the Clark School?

A. Yes, sir.

Q. 5. Have you any document establishing the fact that you were engaged in work on the Clark School?

A. Yes; this letter from Mr. Ittner; he was the head of the School Board, and this letter states that I had erected, that is, done the fireproofing on the Clark School. I also have my time-book.

By consent of counsel, the letter produced by the witness is read into the record at this point, to have the same force and effect as if the original were made an exhibit; it being stipulated that if Mr. Jones shall ask to see the original, counsel for plaintiff will submit it to him.

[fol. 187] Board of Education of the City of St. Louis, Office of the Commissioner of School Buildings

St. Louis, October 9, 1908.

To whom it may concern:

The bearer, Mr. E. Anderson, was in personal charge of reinforced concrete work on the Elleardville, Clark and Webster Schools for the Board of Education, erected under the superintendence of the undersigned. Mr. Anderson understands thoroughly this class of construction and I take pleasure in recommending him to those contemplating such work.

Your respectfully, (Signed) Wm. W. Ittner, Commissioner of School Buildings.

Q. 6. Please describe the manner in which the concrete work of the Clark School was put in place.

A. The building fronted on Union Avenue, with Cabanne running down hill right smart. Now, a mixer and hoist was placed about half-way down on Cabanne. That made the mixer lower than Union Avenue, you see. We put—made an incline so as to wheel the material up in the hopper above the mixer. Then the concrete was taken out from underneath the mixer and wheeled around into a brick elevator, and taken up on the different floors with the elevator, the wheelbarrow being on the elevator. When we got on the floor we wanted to get on, wheeled the wheelbarrow off on the floor and go to [fol. 188] the place where we want to dump it and dump it on the floor. That is the way all the concrete was put on the building. I want to explain right there while I am at it, that this building, in fact, all the school buildings at that time, had brick walls; no fireproofing in them, only the floors; so we had easy access to the surface for our concrete, you see. We didn't have to fill any walls with concrete; they were all brick.

Q. 7. Did you have personal charge of the placing of all of the concrete in this Clark School?

A. Yes, sir, I put in the foundation for Mr. Gerhard. That was not in my contract, but I done that, and he was charged up the actual expenses of putting the foundation in, together with my salary; and after the foundation was put in, then I took charge of the fireproofing as a sub-contractor.

Q. 8. By fireproofing you mean the reinforced concrete floor slabs?
A. Yes; and roof.
Q. 9. Was all of the concrete of this Clark School placed by you by means of wheelbarrows?
A. Yes, sir. We had no other process of getting the concrete on the floors except to hoist in a wheelbarrow.
Q. 10. That is, your wheelbarrows were charged with the concrete mixture from the mixer; then wheeled to the hoist, which had a platform elevator, and the filled wheelbarrows were then hoisted to the desired floor level, and from there wheeled and dumped at the point needed.
A. Yes, sir.
Q. 11. Did you use new or old wheelbarrows on this job?
A. It was all new, at this school.
[fol. 189] Q. 12. In what condition did the wheelbarrows come to you on the job?
A. They come knocked down, that is, not put together; we bought them right direct from a wholesale concern, and had to put the bolts in and connect them up after they got to the building.
Q. 13. Who assembled the wheelbarrows?
A. Oh, some boys I had there, and my son, and two or three other boys; I had several men working there at the time.
Q. 14. You mean your son Hooper Anderson?
A. Yes; Hooper.
Q. 15. He lives here in Los Angeles, and is sick in bed today, is he not?
A. Yes, sir.
Q. 16. It has been testified in this case that all of the concrete of this Clark School at Union and Cabanne Streets was placed in position by means of an apparatus like that shown in defendants' Exhibit No. 31, which is a photograph, and a copy of which I show you. This photograph showing a tower provided with a hopper delivering into a trussed wooden spout. What have you to say as to whether or not an apparatus like this apparatus shown in the photograph, was used in the erection of the Clark School?
A. Nothing of the kind, sir.
Q. 17. You are absolutely positive of that, are you?
A. Yes, sir; none of the schools I built, no apparatus like that; I used wheelbarrows on all of them.
Q. 18. On what other school buildings in St. Louis in which there was reinforced concrete work did you work?
A. McKinley High School; Elleardville School; Clark School; and the Webster Schools; that is four schools that I put the reinforced concrete in.
[fol. 190] Q. 19. When was the Webster school built, as compared with the time of building the Clark School?
A. Started the Webster School about a month or so before we finished the Clark; I have got the time book for both of them here. Here is the beginning of the Clark and the end of the Clark, and the beginning of the Webster.
Q. 20. And what does your time book show as to the dates of your work on the Clark School, and of the Webster School?

A. The beginning of the Clark School was February 24, 1906; ended the Clark School about the middle of April, 1907. We began the Webster School, February 15, 1907.

Mr. Hood: The time books produced by the witness are submitted to counsel for defendant.

Q. 21. Did you furnish to Mr. Gerhard any estimate of the fireproofing on the Clark School?

A. Yes, sir.

Q. 22. What was the amount of that estimate?

A. I will have to read it out of my book; I can't remember. Over $23,585.

Mr. Hood: That is all, Mr. Barton.

Direct examination closed.

(Cross-examination waived.)

Edward Anderson.

(Thereupon an adjournment was had until 1:30 P. M.)

[fol. 191] Los Angeles, California,
Monday, March 14, 1921—9:00 a. m.

(Met pursuant to adjournment.)

(Same counsel present.)

Hooper O. Anderson, a witness called on behalf of plaintiff, being first duly sworn, testified as follows:

Direct examination by Mr. Hood:

Q. 1. Please state your name, age, residence and occupation?

A. Hooper O. Anderson; age, 32; now residing at 3447½ South Hope Street, Los Angeles. Freight agent, Pacific Steamship Company.

Q. 2. What relation are you to Edward Anderson, now living at 1114 Hoover Street, Los Angeles?

A. Son.

Q. 3. Did you do any work on the public school building at Union and Cabanne Streets, St. Louis, Missouri, now known as the Clark School?

A. Yes, sir.

Q. 4. What was that work, when did it begin, approximately, and how long did you work on the building?

A. To the best of my knowledge and recollection, actual construction began in February, 1906, and I was employed on this job until January, 1907. Operating concrete mixer, and also running elevator hoist.

Q. 5. What sort of an elevator hoist did you have on that construction work?

A. A two-cage lift for the accommodation of wheel barrows only.
[fol. 192] Q. 6. How was the concrete in that building put in place?

A. Discharged from mixer in the wheel barrow, conveyed to various floors by means of this elevator hoist, and dumped direct from wheel barrow into beams or on floor panels.

Q. 7. Was all of the concrete of this Clark School placed by the wheel barrow method which you have described?

A. Everything above foundation, yes.

Q. 8. Was the wheel barrow method used on the foundation?

A. The greatest extent was used by wheel barrows. The only other method being a wood trough used from mixer to foundation as convenient.

Q. 9. About how long was that wood trough?

A. Constructed of 1 by 6 material, two pieces of 1 by 6 nailed together, 16 feet long—not exceeding 16 feet.

Q. 10. And that was used for a short time right close to the mixer?

A. Yes, right near the mixer, not any further away than 16 feet, the length of the trough.

Q. 11. Did you use, or was there used, on that apparatus, or at that site, an elevator bucket in which the concrete was deposited and elevated in the tower?

A. No, sir.

Q. 12. What is your recollection relative to the wheel barrows which you used on that job?

A. The question is not clear; I don't fully understand you.

Q. 13. Were the wheel barrows that you used new or old?

[fol. 193] A. These wheel barrows were purchased new, knocked-down. Upon arrival on the job I assembled them, and they were used throughout that job.

Q. 14. I show you Plaintiff's Exhibit No. 31, "Photograph of Franklin School, May 7, 1910." This photograph shows a tower from which is extended a trussed wooden trough. Was any such structure used at any time during the erection of the Clark School?

A. No such structure as you have described as shown in this photograph was used on the Clark School during the year of 1906.

Q. 15. Was any such structure used in the erection of the Clark School during the time you worked on it?

A. No, sir.

Direct examination closed.

Cross-examination by Mr. Barton:

X Q. 16. What does the photograph, Defendant's Exhibit 31, show? Please describe it in a general way.

A. The method used as shown in this photograph would necessitate an automatic dumping bucket being used, which would dump into a hopper and then conveyed to desired locations either through a wood or metal spout.

X Q. 17. In 1906 you had a tower, did you?

A. Yes, sir.

X Q. 18. And you had a trough that you ran the mixed concrete in for something like 16 feet; is that correct?

A. Yes, sir; on the foundation only; an open trough.

X Q. 19. Do you remember any trouble that they had in using the trough?

A. No trouble.

[fol. 194] X Q. 20. It carried the soft or mushy concrete to the place where it was wanted, all right, did it?

A. Yes.

X Q. 21. Give me the names of some of the other boys who worked on that job in the year 1906, if you recall them, and give their residences.

A. Ed Anderson, 1114 North Hoover Street, Los Angeles; my father, W. C. Anderson, Corona, California; brother. Unable to recall any other names.

X Q. 22. Do you know if it was common at that time, that is, in 1906, to convey the mush in constructing a concrete foundation or building, by letting it run down in a trough?

A. To my knowledge, this was not commonly used or generally used. We used it as a method of convenience account of the mixer being placed within few feet from foundation wall.

X Q. 23. Was the mush that you put into the wheel barrows mixed the same as that that was put into the trough?

A. Yes.

X Q. 24. When did you come to Los Angeles to live?

A. 1910.

X Q. 25. Did you ever know a man by the name of George Eberhard as connected with the F. O. Engstrum Company?

A. No.

X Q. 26. Did you ever know a man by the name of Theodore Emtman, also connected with that company?

A. No.

X Q. 27. Did you ever know or hear of Arthur L. Smith, a cement man connected with work in St. Louis?

[fol. 195] A. I cannot recall ever having known him.

Deposition closed.

Hooper O. Anderson.

(Officer's certificate and statutory transmission waived, for defendants.)

(Adjourned to meet on further notice.)

[fol. 196] STIPULATION RE TESTIMONY

It is stipulated that if William B. Ittner were called and examined as a witness on behalf of plaintiffs he would testify that he is

a citizen of the United States residing at St. Louis, Missouri, and has been continuously in practice as an architect since long prior to 1906 that he has designed and produced plans and specifications for many buildings, particularly school buildings, which have been erected according thereto in many parts of the United States; that he was the architect of the Public School in the City of St. Louis at Union Avenue and Cabanne Street, known as the Clark School; that as a part of his duties as such architect he visited the site from time to time during the progress of the building and noted the methods pursued and apparatus used during such building; that he has no recollection of any such apparatus as that illustrated in Defendants' Exhibit 31 having been used during the erection of the aforesaid Clark School, and that if such an apparatus had been so used he is of the opinion that a recollection of it would have remained with him because such an apparatus, while now quite common, was totally unknown to him in 1906 during the progress of building the Clark School; that he is positive that no such apparatus was used in fabricating the Clark School; and that he has no acquaintance with any of the parties to this cause and is not now and since 1910 never has been engaged as a contractor or builder.

It is further stipulated that if P. J. Curran were called and examined as a witness on behalf of plaintiffs, he would testify that [fol. 197] he is a citizen of the United States, residing at St. Louis, Missouri, and is now employed on the Municipal Docks of the City of St. Louis; that during 1906 he was in the employ of the Board of Education of the City of St. Louis and was the inspector for said Board of the Public School building at Union and Cabanne Avenues known as the Clark School; that he was in daily attendance at that building site; that the concrete for foundations was placed by dumping the concrete from the mixer into wheel barrows and wheeling it to the desired locations; that he does not recall how the concrete was placed in the building above the foundations, and that his recollection is that there was nothing in particular in connection with the concrete work to call his attention especially to the method of handling the concrete.

That witness has no acquaintance with any of the parties to this cause, has no interest in the present litigation and is not now and never has been engaged as a contractor or builder except as an inspector.

Arthur M. Hood, of Counsel for Plaintiffs, Indianapolis, Indiana. G. Boyd James, of Counsel for Defendants, Chicago, Illinois, April 15, 1921.

[fol. 198] STIPULATION RE TESTIMONY OF R. M. MILLIGAN

It is hereby stipulated and agreed by and between counsel for the respective parties that if R. M. Milligan were called and examined as a witness on behalf of the plaintiffs he would testify that he is of mature age; that he is Commissioner of School Buildings of the

Board of Education of the City of St. Louis, Missouri; that he has charge of the records relating to the erection of school buildings in the city of St. Louis; that there is, and has been since 1907, only one colored high school in the city of St. Louis and that it is known as the Sumner High School Building; that he has examined the records of the Board of Education relating to the erection of said building; that the general contract known at Letting No. 1218 for said building was let to Pelligreen Construction and Investment Company, September 8, 1908, and final payment was made March 3, 1911; and that he has examined said records relating to the building of the Franklin School, and that the general contract known at Letting No. 1280 was let June 28, 1909, to E. C. Gerhard Building Company, final payment being made April 13, 1911.

Arthur M. Hood, Counsel for Plaintiffs. George Boyd James, Counsel for Defendants.

July 25, 1921.

[fol. 199] IN UNITED STATES DISTRICT COURT

[Title omitted]

Before Hon. Oliver B. Dickinson, J.

Philadelphia, Pa., October 3, 1921.

Present: Cyrus N. Anderson, Esq., and Arthur M. Hood, Esq., representing the plaintiffs; George B. Jones, Esq., and Thomas H. Sheridan, Esq., representing the defendants.

Counsel for defendants moved to file an amendment to answer. The Court grants the motion with respect to all the features of the amended answer other than the cross-bill feature, and leave to file that amendment is denied, and an exception allowed to the defendants.

PLAINTIFFS' EVIDENCE

Mr. Hood: I offer in evidence the patent in suit, No. 948,719, marked "Plaintiffs' Exhibit N."

I also offer in evidence as plaintiffs' exhibits, photographs A, B and C, which accompanied the Pierce affidavit, the same to be marked [fol. 200] respectively, "Plaintiffs' Exhibits F, G and H, Defendants' Structure," these photographs having been admitted by the defendants in their answer.

I also offer in evidence photographs A, B, C, E and F, which accompanied the defendants' affidavit by Prettyman in connection with the preliminary injunction proceeding, those photographs to be marked respectively "Plaintiffs' Exhibits I, J, K, L and M, Defendants' Apparatus, Subsequent to Bill of Complaint."

EDGAR H. THOMPSON, having been duly sworn, was examined and testified as follows:

By Mr. Hood:

Q. 1. Will you please state your name, age, residence and occupation?

A. My name is Edgar H. Thompson, 41 years of age, and my occupation is superintendent of United States Construction Company, 841 Broadway, New York, at the present time residing in Mount Vernon.

Q. 2. State briefly what your duties are at the present time, especially in connection with the fabrication of re-enforced concrete buildings?

A. My duties at the present time are the supervising of all the re-enforced concrete connected with the Edison Light and Power Company at Port Morris, New York, where we are now installing a power plant.

Q. 3. How big a job is that both in area, height and approximate cost?

A. The size of the building is 480 by 370, total height over all 149-6, total cost of job complete including equipment, approximately thirty-eight million dollars.

[fol. 201] Q. 4. And you have entire charge of the fabrication of that building?

A. I have entire charge of the fabrication of that building and the installing of the equipment with the exception of the generators.

Q. 5. What has been your occupation briefly during the past six, seven or eight years?

A. I have been the superintendent of re-enforced concrete construction through the Middle West, Detroit, Saginaw, through Michigan, as far south as Kentucky, during that period of time, and at all times supervising the construction of buildings.

Q. 6. What, if any, experience have you had during the past six or seven years in the use or utilization in the fabrication of concrete buildings of an apparatus similar to that which is illustrated by this model before you where there is a tower, a hoist, a skip and a hopper, which is carried by the tower, and which is raised from time to time on the tower as the building progresses, a chute connected with the hopper in such a way as to receive the hopper discharge, and supported on the tower, and a boom, which is also supported on the tower capable of being swung back and forth, and of being raised from time to time as the building progresses, and that boom supporting the first chute section.

A. Well, at the present time, I have two of those concrete plants installed on the work.

Q. 7. Have you had any experience during the period mentioned with an apparatus embodying the tower, the skip, the hopper and chutes supported by other means, such, for instance, as trestle work on the building, or by a beam suspended from cables running from the tower and anchored to dead men?

A. I have had experience with cables running from the tower anchored to dead men within the last five years.

[fol. 202] Q. 8. How does the apparatus which embodies the swinging boom supporting the chute sections compare in usefulness and economy of operation with a similar apparatus in which there is no boom and in which the chutes are supported in some other way such, for instance, as being suspended from dead men cables?

A. There is only an occasional building you can use a dead man cable on. Now, there are so many jobs, that it is next to impossible to install cables, due to being tied up with room area around your building, that I would not say that they would compare at all. In fact, the construction of a cable with chutes attached to it is a much more expensive plant to install and to operate than a boom counter-balanced which is known amongst construction men as a counter-balance chute.

Q. 9. What advantage, if any, is there is an apparatus for chuting concrete of such character that the space over which the concrete is to be deposited is left free from obstruction such as trestles, chute supporting trestles, things of that kind?

A. The advantage in that particular boom and chute means that you can pour approximately one hundred feet away from your tower. For instance, you are on a building, and you could get fifty to seventy-five feet of your re-enforcing steel down, and you can begin your operation, and still continue your operation of laying steel and building forms, due to the freedom you have got around your tower. In other words, there is nothing in your way. You are at no disadvantage to construct your re-enforcing steel or build the forms.

Q. 10. Is it easier to shift a boom-supported chute from one level to another than it is to shift a series of chutes that are supported on trestles, supported on a dead man cable?

[fol. 203] A. Yes, I should say it was.

Q. 11. During the past few years have you had any experience in the distribution of concrete by means of an apparatus which comprises a tower, a skip, a hopper, so arranged that it would deliver into buggies or wheelbarrows, the concrete then being wheeled from the tower to the points of deposit?

A. I have.

Q. 12. How does that method of operation compare as to cost with the operation of mechanism where the chutes are supported by swinging the boom on the tower?

A. At the present prices of labor, it is about two-thirds higher, by wheeling or transporting your concrete in either buggies or barrows.

Q. 13. What difficulties, if any, are experienced in the buggy or wheelbarrow method of transportation in connection with the re-enforcing bars and the electric wiring, plumbing, piping, and so forth, which is to be embedded into the concrete?

A. Take for illustration, a building approximately one hundred feet long. You naturally work in a pretty small area. Now, the

tower is generally placed in the center of a building, as nearly as you can get it. That means that, before getting started pouring any concrete, you must have your steel laid past the discharge point of your bucket on your tower. In other words, it makes it very inconvenient to get your reenforcing steel through under your runways, without advancing the cost of the laying of the steel. Under those conditions, we generally lay our steel beyond the point from where we are at first going to distribute the concrete, because it is almost impossible to install the steel under these runways after they are once put down.

Q. 14. After you have your runways installed over your re- [fol. 204] enforcing steel, and other parts that are to be embedded, do you have any difficulty with the men running the buggies or wheelbarrows off the runways and disturbing the re-enforcement, and so forth?

A. We have.

Mr. Jones: I object to the leading nature of these questions. We are very glad to have all of these facts brought out, but we suggest that the question be presented in a little less leading form.

The Court: Let me make this inquiry. Is this testimony directed to the utility feature of the invention?

Mr. Hood: Yes, sir.

The Court: Do you propose to put in evidence that the defendant has used the features which you claim to have patented?

Mr. Hood: Yes.

The Court: You need not spend much time over the question of utility. If they have used what you claim to be your invention, it will hardly lie in their mouth to dispute that question, of whether it is a good thing to use, or not.

Mr. Hood: They have had witnesses who testified that it was not any good at all, and I think it is advisable to have this testimony.

The Court: Use your own judgment.

Mr. Hood: We will not take up much time with it.

The Court: Ordinarily it hardly amounts to very much for a man to use the claimed invention of another, and then to say it is of no use.

Mr. Jones: We have not taken that position. In fact, we are ready to admit that it is a useful thing, if that will save any time.

Mr. Hood: May we understand, then, Mr. Jones, that you are willing to admit that a structure such as embodies a boom swinging [fol. 205] from a tower and supported by a tower, and itself supporting a chute section, which is also carried by the tower, is useful as compared with a structure where the chutes are supported by trestles, or tied to the building framework or supported by or from guy lines from the tower?

Mr. Jones: We will admit that it is useful, and is a great convenience in certain special cases. I think that is all you require, is it not?

Mr. Hood: That is all, yes.

Cross-examination by Mr. Jones:

X Q. 15. How long did you say you had experience in re-enforced concrete construction work, or concrete work in general?

A. I have been in concrete work, starting on the basis of sidewalks at the age of twenty-two years to the present date. A matter of nineteen years. Eighteen and a half to nineteen years, on re-enforced concrete work.

X Q. 16. Is it a fact that the concrete used today is wetter or dryer than it was say ten or fifteen years ago?

A. Wetter.

The Court: What do you mean by that? More liquid?

Mr. Jones: More water in it.

The Court: More liquid?

Mr. Jones: Yes.

By Mr. Jones:

X Q. 17. Do you recall about how many years ago wet concrete came into use as distinguished from the so-called dry concrete?

A. My experience might vary a little there from your data. I [fol. 206] was through the Middle West at that time. During the year 1909 was practically my first experience with pouring, as we call it, massed concrete, that is, dense enough to place itself around re-enforcing steel, without any tamping.

X Q. 18. Do you wish us to infer from one of your answers that the buggies are still being used in special cases under certain conditions?

A. Undoubtedly they are.

X Q. 19. In building re-enforced concrete constructions, is it not a fact that many special problems arise, and that the apparatus used is adapted to a particular job, and is changed from time to time, depending on the conditions to be met?

A. You mean with regard to the booms, towers and chutes? Is that what you are referring to?

X Q. 20. Yes, the apparatus in general.

A. There are no two construction jobs that are absolutely alike, at least I have never been able to find them.

X Q. 21. Some of them vary quite materially?

A. Yes. On the particular job that I mentioned a few minutes ago, it would be impossible to use any other rig, to chute the concrete over, but that particular design right there. It would be impossible to use any other rig successfully. (The witness refers to the model which is before him.)

X Q. 22. The runways for the buggies you have referred to are nothing but planks?

A. That is right.

X Q. 23. Thrown over the floor?

A. Planks set on horses, on horses aproximately sixteen inches high, built like a carpenter's horse.

X Q. 24. Or they may be laid, may they not, directly over the

re-enforcing bars which in turn are supported by these secure spacing devices?

[fol. 207] A. No, sir, not if he was a good construction man, he would not allow the planks to be laid over the re-enforcing steel.

X Q. 25. It is preferable to block them up slightly?

A. They must be blocked up in order to keep your steel in place.

X Q. 26. When you first saw the apparatus used involving a chute hung from a tower by a boom, was the chute fixed in position during the pouring of the concrete in a particular location, and then swung to some other position? In other words, was it fixed for the time being, and then moved to another position and held, and then possibly to some other position of adjustment?

A. The very first chute I ever saw installed having a boom, the boom was in a fixed position, allowing a drift line enough so that the chute could be swung in various positions.

X Q. 27. What I meant was, was that swinging done at intervals, that is, you would first pour in one place, and then swing your boom, and pour in another place?

A. It is always done at intervals with any boom.

X Q. 28. Was the chute wholly supported by the boom on this first occasion you spoke of, do you recall?

A. Yes, wholly supported by a boom.

X Q. 29. About when was that?

A. You might call this a boom, and you might not. The boom was in a fixed position, with a line hanging to it. That was in 1914, I think. I could not say for certain; 1913, I believe. It is simply a fixed timber off the head of the tower, with a line hanging to it. That was in 1913, I believe.

X Q. 30. You mean a horizontal timber at the top of the tower, or an inclined timber?

[fol. 208] A. A timber run right through the head of your tower, coming out, as you see, about where that block is, then you dropped a cable down off of that, attached it to the end of the chute, and that allowed your drifting position.

X Q. 31. Do you know whose apparatus that was?

A. Yes, it was Insley's chute. I rigged it up myself. I rigged it up myself, or it was done under my supervision, in order to build this particular job.

X Q. 32. You mean you simply bought the sheet metal chute from Insley and devised the rest of the apparatus yourself?

A. I did, I bought the chute and the tower, a wooden tower. It was a wooden tower, then the chute, then we stuck our timber out on the tower.

(Objected to as immaterial.)
(Objection overruled.)
(Exception noted for the plaintiff's by direction of the Court.)

By Mr. Jones:

X Q. 33. Was this apparatus you rigged up your own idea, or where did you get the idea from?

A. No, it was my own idea, simply the same as any construction man would do who was on a job, he would see something to be done in order to make the work a little cheaper for the firm he was representing, and went on and did it.

X Q. 34. Did it work satisfactorily?

A. Oh, yes. It did on this particular job, but it never was installed again.

Re-direct examination by Mr. Hood:

R. D. Q. 35. The apparatus you have just been talking about, where you said you had a stick which projected out from the tower, that was a stationary member that could not be swung from side to side?

[fol. 209] A. It was a stationary member.

R. D. Q. 36. Then the chute was suspended from that, only it swung very little from side to side?

A. It just swung to the drift of your line at the guy end of your chute.

R. D. Q. 37. But in order to have a chute deliver at any point straight out from the tower, you had to put a guy line on it, and pull it over and hold it over?

A. Yes, sir.

R. D. Q. 38. In one of your answers I understood you to say that there were certain places, certain kinds of jobs, where the apparatus, such as you have before you in this model, was the only thing that could be practically and successfully used. Is that right?

A. That is correct.

R. D. Q. 39. And by that you mean an apparatus in which the first two sections of the chute were supported by the boom, and the boom could then swing and give freedom of operation and clearance of space adjacent to the tower for placing the concrete?

A. I meant for the first 100 feet the chute was entirely supported by the tower.

R. D. Q. 40. And that would be substantially true even though the lower end of the second chute had to be held in the hands of the operator as he walked around, rather than by a counter-weighted chute such as you have here?

A. Yes, it would.

Mr. Hood: I have another witness who will testify as to the utility and so forth, but, in view of what has been said, Mr. Jones, may we understand that if Mr. Strieffler were called, he would testify that he is a practical construction man, and would substantially corroborate what Mr. Thompson has said?

Mr. Jones: I think the agreement we made heretofore covers the [fol. 210] situation about as far as we care to go.

The Court: Don't that substantially cover it? As I understand it, it comes down to this, that the question of the utility of this invention, if it is a real invention, is not raised. That is what it means to my mind.

Mr. Hood: I do not think I heard that.

The Court: It amounts to this, that the question of the utility of this invention, assuming it to be a real invention, the invention as claimed by you, I mean, is not raised.

Mr. Hood: Except this, that the defendants, even under the admission they have made will say, "Oh, yes, there is some utility, but it is infinitesimal, it is not worth talking about." As a matter of fact, it is worth talking about, and I want the record to show that it is.

The Court: It comes back to this broad proposition; I have had occasion to make several observations upon it several times; it is perfectly idle for an infringing defendant to say the thing which he has taken and is using is of no use. If that were so, why did he take it? That is the answer to the question, ninety-nine times out of a hundred. So that it is a waste of time to show utility with respect to an infringing device.

Mr. Hood: Then, Mr. Strieffler may be excused. It is not necessary to call him.

W. H. INSLEY, sworn.

By agreement of counsel a certified copy of the record and briefs in the case of the Concrete Appliances Company and W. H. Insley against Dietrich Menken, and others, in the United States Circuit [fol. 211] Court of Appeals for the Sixth Circuit, No. 3241, is offered in evidence as a joint exhibit, and marked "Sixth Circuit Record."

By Mr. Hood:

Q. 1. Please state your name, age, occupation, residence, and your relation to this case.

A. W. H. Insley, age 51. Residence, Indianapolis, Indiana. I am an engineer and manufacturer and a party plaintiff.

Q. 2. The record in this case in the joint exhibit which has just been offered shows that you are the exclusive licensee under the patent in suit?

A. Yes.

Q. 3. Does that exclusive license still exist in force?

A. Yes, sir.

The Court: Is he speaking of himself individually or the concern with which he is connected?

Mr. Hood: As an individual. He has a working arrangement.

The Court: He is one of the parties plaintiff?

Mr. Hood: Yes, he is one of the parties plaintiff?

By Mr. Hood:

Q. 4. The Insley Manufacturing Company manufacture chuting appliances under your authorization, do they?

A. They do.

Q. 5. Will you describe briefly the general characteristics of chuting appliances which your company, or you and your company,

manufacture and sell under your license agreement under the patent in this suit?

A. They include a steel tower, a hoist bucket, a hopper, chutes, a boom, substantially as is represented by the structure on the floor.

[fol. 212] Q. 6. How long have you and your company been manufacturing an apparatus of this kind, including a boom and supported chute carried by the tower?

A. About ten years.

Q. 7. About how many such devices have you manufactured and sold during that period?

A. Well, a good many. I should say several thousand. It is difficult to make it more definite than that.

Q. 8. And to what extent are they distributed over the country?

A. They are distributed very widely, not only in the United States but in England, Europe, Canada, Mexico, South America, practically throughout the world.

Q. 9. Can you state approximately the number of such plants that have been sold for use in the city of New York alone and in the vicinity of New York?

A. I think one hundred and fifty within the last two or three years.

Q. 10. And approximately what do these tower apparatus, including the boom and chute and hopper and skip, sell for as an average?

A. Approximately $3,500.

Q. 11. Have you under your authorization of license from the Concrete Appliances Company made any arrangements with other manufacturers, license arrangements, by which they are empowered to manufacture similar devices?

A. I have licensed two other manufacturers.

Q. 12. Who are they?

A. The Lakewood Engineering Company of Cleveland, Ohio, and the Ransom Machinery Company of Dunellen, New Jersey.

Q. 13. How do these companies stand in the manufacturing world as to size and equipment and ability to manufacture properly effi-

[fol. 213] cient apparatus of this kind?

A. They are among the leading large manufacturers of equipment of this general character.

Q. 14. Are you and your two licensees able to supply the demand in this country for apparatus of this kind?

A. We are.

Q. 15. At a reasonable price?

A. They are.

Q. 16. And you do supply such apparatus at a reasonable price?

A. We do.

Q. 17. I show you Plaintiffs' Exhibits F, G, and H, and ask you to describe briefly the construction which is illustrated by those photographs, these photographs, Exhibits F, G, and H being photographs, A, B, and C which were attached to the Pierce affidavit in the preliminary injunction matters?

A. These photographs show a plant for distributing concrete by

gravity, including three towers, one of which towers, B, shows a hopper attached to a face of the tower, and the combination boom and chute projecting from the hopper, this being a structure which is so trussed and re-enforced, that it forms the equivalent of a boom, and led from that are other chutes swiveled to it.

Q. 18. What is the part marked 4 on these photographs?

A. The part marked 4 is a member known in the trade as a combination boom chute, that is, a boom and chute built together as one member, instead of separate members as shown by the model on the floor.

Q. 19. How is it connected to the hopper?

A. It is connected to the hopper with a swivel joint.

[fol. 214] Q. 20. That is indicated at the part 7 on the photograph?

A. That is indicated at the part 7 on the photograph, yes, sir.

Q. 21. What is the part 2?

A. Part 2 is a receiving hopper.

Q. 22. And is that hopper vertically adjustable on the tower?

A. The hopper is vertically adjustable.

Q. 23. What is part 6?

A. The part 6 is a line which supports the end of the combination boom chute to the tower.

Q. 24. That is to say, the chute section combination boom chute 4 is entirely supported by the tower?

A. Yes.

Q. 25. Owing to the suspension of the line 6 and the pivotal connection with the hopper?

A. Yes.

Q. 26. Is that combined boom and chute capable of being swung over a horizontal area?

A. It is.

Q. 27. What is the part 5?

A. The part 5 is an additional chute which is pivoted to the first chute section of the combination boom and chute section.

Q. 28. And how is it supported at its end adjacent the combined boom chute section 4?

A. It is supported on the end of the chute.

Q. 29. So that the part of the weight of that second chute section 5 is supported from the tower through the medium of the first chute section and line 6?

A. Yes, sir.

Q. 30. Is the combined chute and boom section 4 capable of being adjusted vertically during the progress of the work?

A. Yes.

[fol. 215] Q. 31. I call your attention now to Plaintiffs' Exhibits I, J, K, L and M, which are respectively photographs A, B, C, E and F, which accompanied the defendants' affidavit by Prettyman in the preliminary injunction matters. Is the apparatus shown in and substantially identical with the second chutes section in the previous exhibits F, G, and H?

A. Yes.

Q. 32. What difference do you notice in these last photographs?
A. The difference is that there has been added to this plant a boom from the tower out to the end of the chute which is to support the end of the chute.
Q. 33. By that do you mean the stick which is at the lower end connected with the tower and is inclined upwardly and outwardly and connected to the outer end of the element you have called the trussed boom chute?
A. Yes, sir.
Q. 34. And how is that stick connected with the tower?
A. It is connected with the tower by a hinge which will permit it to swing horizontally.
Q. 35. Do these photographs show that the hopper and the combined boom chute and the added boom or upwardly inclined brace have been raised from time to time as the building progressed?
A. They do.
Q. 36. How does the second chute section in these exhibits, I, J, K, L and M compare with the second chute section in Exhibits F, G and H?
A. In the later exhibits the second chute section is counter-weighted, and in the first it is simply a chute which can be supported on the outer end by men.
Q. 37. In other words, the apparatus as shown in Exhibits F, G, [fol. 216] and H has been modified by removing the second chute section and substituting a chute section which is counter-weighted and substantially identical with the second chute section in the model before you?
A. Yes, sir.
Q. 38. Who originated the counter-weighted second chute section?
A. I did.
Q. 39. Have other manufacturers generally respected your individuality in this respect?
A. There is no patent on the counter-weighted chute section.
Q. 40. But is this construction generally copied by others?
A. Yes, very recently it has been copied.

(Defendant admitted notice of the patent prior to the filing of the bill of complaint under section 4900.)

Cross-examination by Mr. Jones:

X Q. 41. About what is the percentage of profit on this $3,500 apparatus which you sell?

(Objected to.)
(Question withdrawn.)

X Q. 42. Before you become licensee of the Concrete Appliances Company you manufactured and sold an apparatus, did you not, comprising the five elements of the patent in suit, the tower, the hoist, the hopper, the boom and the chute, in disregard of this Callahan patent in suit?

(Objected to as not cross-examination.)
(Objection overruled.)
(Exception noted for the plaintiffs, by direction of the Court.)

A. I did.

[fol. 217] By Mr. Jones:

X Q. 43. Did you not make statements to various parties in the trade from time to time that this Callahan patent was no good, so to speak, and invalid?

A. In my judgment.

X Q. 44. There was a suit brought on this patent in the Vancouver, B. C., Court, Canada, in 1913, was there not, in which your apparatus was charged as an infringement and you defended the suit?

(Objected to as not proper cross-examination.)

The Court: Before he became practically the owner of this patent, we will assume that he thought it was no vadidity, and he did what, if it was valid, would be an infringement. An action of that kind was brought against someone so nearly connected with him that he was called upon to defend, and he did defend. Of what help to us is it to have that gone into at all?

Mr. Jones: I am leading up to the fact that in the defense of the Canadian suit Mr. Insley had depositions taken in St. Louis by Mr. Schley, Mr. Hood's partner, calling a half dozen witnesses, who testified about certain very serious prior uses. Later, when Mr. Insley became licensee, having control of the litigation, he brought suit in Cincinnati in a case which went to the Court of Appeals, and in which these prior defenses were not in the record at all, the defendant apparently not knowing about them, Mr. Insley through his attorneys urging that the patent should be sustained as a broad pioneer patent, over very meagre defenses, consisting simply of copies of certain patents, the practical art as developed in St. Louis being entirely omitted. Mr. Insely now asks this Court to give full weight to this Cincinnati Court of Appeals decision, [fol. 218] which we are prepared to show was based on what was a very meagre and incomplete defense.

The Court: We are practically taking depositions, so that I will admit anything which counsel think would be of materiality and substantial value, subject to the objection. Evidentiary questions will be ruled on along with the other questions which may arise in the cause, and with leave now granted to the plaintiffs to move to strike out. I will go further, and let the record show that the motion has been made, and I will dispose of the motion to strike out, and allow an exception to either side, according as the final ruling may be. I will take it subject to the objection, and consider the value of the objection along with any other questions that arise.

By Mr. Jones:

X Q. 45. To make the question short, is not the statement that I just made to the Court substantially correct with reference to the Canadian and St. Louis litigation?

A. I don't know, your Honor, whether I want to answer that.

By the Court:

X Q. 46. The question is substantially this: You were a party to the Cincinnati litigation?

X Q. 47. And was not that litigation conducted without a disclosure by you of the prior uses which had been made a feature of the Vancouver litigation?

Mr. Hood: Your Honor, he was the plaintiff in that case. That was not up to him. He was the plaintiff in the Cincinnati case.

The Court: It is not a question of whether it was up to him or not. The question is, did he or did he not make a disclosure of it?

The Witness: No, not to my knowledge.

[fol. 219] By Mr. Jones:

X Q. 48. And the Cincinnati case, of course, was much later than the Canadian case?

A. Yes, sir.

X Q. 49. You have let it be known quite generally, have you not, that under this Cincinnati decision you have a broad monopoly on practically all apparatus for distributing concrete from a tower through chutes?

A. Only with a boom.

By the Court:

X Q. 50. Do you mean by that broadly the boom feature, or merely the chute supporting function of the boom feature?

A. I mean by that that we have not claimed a monopoly on the plant distributing concrete by gravity excepting in so far as the chute is used suspended by a boom or combined with the boom.

By Mr. Jones:

X Q. 51. However, you have advertised rather widely the Cincinnati decision, have you not?

A. We probably have, yes.

X Q. 52. And until we filed our interrogatory in this case asking whether the chutes hung from an inclined cable, as distinguished from a boom, were an infringement, you were quite willing to have the public believe that even this type was an infringement, were you not?

Mr. Hood: It seems to me we are encumbering the record with an expression of opinion. It does not make a particle of difference

what this witness may have thought his patent covered, or what he he may have claimed it covered.

The Court: That will not do. This is a proceeding in equity, in which he is asking for the extension of the grace of the Chancellor. [fol. 220] This line of interrogation is based upon the clean hand doctrine of the Courts of Chancery.

Mr. Hood: I have no serious objection to it at all. It is all right, if the Court wants to have the information, but it does seem to me that there is more padding of the record than there is any necessity for.

The Court: I will not restrain counsel. He may develop all the circumstances he thinks proper.

Mr. Jones: I will try to make it as brief as possible, but there is quite a direct connection, I think, between the two cases.

By Mr. Jones:

X Q. 53. Do you understand the question?

A. Read the question again.

(Question No. 52 repeated.)

A. May I answer that by an explanation, your Honor?

By the Court:

X Q. 54. You had better answer the question, then explain. That is the usual way.

A. Yes.

X Q. 55. You either did or you did not. Answer the question, yes or no; then explain.

A. My answer is "Yes" and my explanation is that up to the time of the Cincinnati suit we did have patents which covered substantially the distribution of concrete by gravity through chutes, by any character of chutes, and after the Cincinnati decision the question never came up definitely for a decision as between us and any possible competitor until you brought the question up in relation to this case.

By Mr. Jones:

X Q. 56. You refer to the Arthur L. Smith patent, in which patent priority of invention was conceded by Callahan in an interference proceeding, do you?

[fol. 221] A. I refer to the Arthur L. Smith patent, yes.

X Q. 57. And you advertised this apparatus very extensively, did you not?

A. Yes, sir.

X Q. 58. And spent a great deal of money on your advertisements?

A. Yes, sir.

X Q. 59. Have your advertisements since the Cincinnati decision endeavored to differentiate between chutes supported by a boom and chutes supported in any other way?

A. We endeavored to sell a number of chutes supported by a boom. We do not advertise any other chute.

X Q. 60. In your notices to other possible infringers after the Cincinnati suit, did you attempt to point out that your monopoly was limited to a boom support as distinguished from the broader monopoly you previously thought you had?

A. We never gave any notice to any infringers except where the boom plant is used.

X Q. 61. Do you know about how many suits have been based on this Callahan patent?

A. This is only the third one that has come to trial that I know of.

X Q. 62. I mean, how many suits were started, roughly?

A. Two others, I think, besides, as nearly as I recall now.

X Q. 63. Mr. Hood mentioned in one of our St. Louis depositions a considerable number of other suits. You are not familiar with the one in Western Pennsylvania, the one in St. Louis, the one in Los Angeles, and one in Cincinnati, and one in Chicago?

Mr. Hood: I did not mention any in Los Angeles.

[fol. 222] A. These cases to which you call attention, the infringement immediately ceased upon notice of filing the suit. There was no further infringement.

By Mr. Jones:

X Q. 64. So that the Cincinnati case is the only one which actually went to trial in the United States?

A. That is right.

By the Court:

X Q. 65. You had better clear that statement upon the record. A moment age you spoke of this being the third case which had come to trial.

A. I had reference to the Vancouver case under which the same patents were involved.

X Q. 66. I supposed you had. I did not think it was clear without that statement.

A. Yes.

By Mr. Jones:

X Q. 67. The defendants in each of those other cases were small contractors, were they not?

A. No. That is not the case. The defendant in the suit that was instigated at Chicago was a very large contractor, who endeavored to get behind him the whole Contractors' Association of Chicago and St. Louis.

X Q. 68. And as a result of that activity you did not press that suit but allowed it to be dismissed ofter four years of inaction. Is that true?

A. Approximately.

X Q. 69. With reference to this Philadelphia apparatus shown in the photographs, and alleged to be an infringement, you have referred to the part 4 of Exhibit H, as a combination boom and chute. As a matter of fact, that is nothing but a chute trussed with a light frame of wires to stiffen it, is it not?

[fol. 223] A. That is substantially a boom which incorporates a chute.

X Q. 70. In the photographs taken a little later of this apparatus, in which an inclined prop or so-called boom has been incorporated, is there any other boom in that photograph, other than the heavy inclined boom which supports the outer end of that chute?

A. There is. That is the member marked 4 on Exhibit H, which is substantially a boom.

X Q. 71. However, in none of these Philadelphia photographs is there shown a boom as an element separate and distinct from the chute itself, is there, except the photographs which show the later added wooden prop?

A. No.

X Q. 72. And if that trussed chute were made a little stiffer, or of heavier metal, there is no reason why those wire braces might not be dispensed with, is there, and in fact chutes have been used in a similar manner without such re-enforcement, have they not?

A. Not where they are supported from the tower. That trussing is absolutely necessary.

X Q. 73. However, the only purpose of it is to stiffen or strengthen the chute, is it not?

A. So that it can perform the function of a boom.

X Q. 74. Aside from the boom, will you kindly answer the question. The only purpose of it is to stiffen or strengthen the chute, is it not?

A. No, it is not. The purpose of it is to give that member the character of a boom.

X Q. 75. Do you wish the Court to understand that you deny that that frame and wire arrangement stiffens the chute and strengthens it?

A. Yes, sir, as a chute. That wire and struts are not necessary to stiffen the chute as a chute. The chute does not need that stiffening as a chute.

[fol. 224] X Q. 75. Regardless of whether it needs it, the strengthening effect is there, is it not?

A. The strengthening effect is there, yes.

X Q. 76. On these photographs showing the inclined prop, the counter-weighted chute hung from the end of said props considerably heavier, is it not, than the prior chute 5?

A. Yes.

X Q. 77. This prior chute 5 in the earlier photograph, Exhibit H, is supported in part on a trestle on the floor?

A. Yes.

X Q. 78. And the third section, 5A, is entirely supported by trestles on the floor?

A. Yes.

X Q. 79. So that it will have to be moved about by workmen, lifting it up and carrying it around?

A. Yes.

X Q. 80. Is this one of your advertisements in the American Builder, November, 1920?

A. Yes, sir.

X Q. 81. Do you consider that that vertical post or the mast is a tower?

Mr. Hood: That is objected to. It seems to me the examination of this witness about other structures he manufactures, which are radically different in appearance, and so forth, is wholly immaterial, whether he thinks they are within this patent or not. Why should this case be burdened with testimony of that kind? It cannot possibly affect any question involved in this case. It happens that the particular structure that is now being asked about is involved in another subsequent patent, but it has no bearing on this case at all.

The Court: If you can always be sure that you can correctly forecast the purpose of a cross examination of counsel you can safely [fol. 225] rule upon it, but sometimes if cross-examining counsel discloses the theory of his cross-examination, there is not much use for cross-examination. I do not like to control a cross-examination. I put it up to counsel to keep within the limits of materiality, both legally and practically.

(Question repeated.)

A. No.

By Mr. Jones.

X Q. 82. Do you recall writing a letter to W. L. McDonald and Company, November 27th, 1918, in which you state that a device which he has submitted to you has some fundamental disadvantages, and that, therefore, you would not consider it advantageous for you to take it up and put it on the market, as shown in what purports to be a copy, which I show you?

A. I do not recall that letter.

X Q. 83. Please look also at the print of a patent application which is said to have accompanied the letter, illustrating the apparatus, consisting of a mast with a hopper and chute suspended from a boom.

A. I do not recall it.

X Q. 84. The photographs of the alleged infringing Philadelphia apparatus illustrated three distinct types of chute suspension, do they not, the line suspension crossing the railroad tracks, the block and tackle connection from the top of the tower to the outer end of the first section of the chute, and a similar arrangement, with the addition of an inclined prop or boom to help support the weight of the additional counter-weighted section, do they not?

A. Yes, sir.

X Q. 85. Is it a fact that the concrete used today is very much more wet or "sloppy" that it was ten or fifteen years ago?

A. It is according to the plant it is used in. It is owing to the [fol. 226] method of distribution. That is not a question that can be answered directly.

X Q. 86. That mush concrete is much better adapted to slide through pipes and chutes than dry concrete?

A. Yes, sir.

X Q. 87. In fact, dry concrete discharged through a pipe will frequently clog the pipe, will it not?

A. Yes.

X Q. 88. Unless the pipe is very large indeed?

A. Yes, sir.

X Q. 89. And it will also clog the chutes?

A. Yes, sir.

X Q. 90. Are you familiar with the standard apparatus of the Ransome Concrete Company?

A. Yes.

X Q. 91. It consists of an apparatus very similar to this model in that it comprised a tower, a hoist, a hopper and a gate permitting the concrete to be discharged into wheelbarrows?

A. Yes, sir.

X Q. 92. That apparatus was used very extensively as early as 1906, was it not?

A. Yes.

X Q. 93. There has been a great deal of discussion in the engineering magazines in the last ten or fifteen years, has there not, with reference to the relative merits of dry and wet concrete?

A. Yes.

X Q. 94. At first many architects and engineers were much opposed to the increased use of water, were they not, on the theory that the concrete was not as strong as it would otherwise have been?

A. Yes.

X Q. 95. And there has been a gradual change over a period of [fol. 227] years in this prevaling belief until now wet concrete is used very extensively and is practically essential in re-enforced concrete buildings, is it not?

A. Yes.

X Q. 96. And there are even a few architects today and others, such as the United States Government officials, who object to wet concrete, is that not true?

A. No, that is not true, as you state it. There are a few government officials that object to it, but as a rule the government officials do not object to it.

X Q. 97. My point was, there are still a few people who have not been converted?

A. There are still a few, yes.

Redirect examination by Mr. Hood:

R. D. Q. 98. You were asked about a certain suit that was brought against a Chicago manufacturer. The inference left was that you discontinued that suit because you were afraid to continue it. What

were the facts about your discontinuance of that suit? Did the manufacturer in that suit continue his infringement?

A. It was a contractor. He did not continue his infringement, but acknowledged that he did not wish to fight the matter out.

R. D. Q. 99. And you understood that he discontinued the infringement?

A. Yes, sir.

R. D. Q. 100. And in the Cincinnati case, who actually defended that suit, the contractor, who was one of the parties, or the manufacturer of the apparatus?

A. The manufacturer actually defended the suit.

R. D. Q. 101. And after the suit was completed did he account to you for his past infringement?

A. Yes.

[fol. 228] R. D. Q. 102. And discontinued further infringement?

A. Yes.

R. D. Q. 103. And he became associated with one of your licensees, did he not?

A. Yes, sir.

Recross-examination by Mr. Jones:

R. X Q. 104. Who is this Chicago contractor? Is that the Witherspoon-Engler Company?

A. Yes, sir.

R. X Q. 105. Do you mean to say that they discontinued using the apparatus before they finished the building, or that they finished their work and then discontinued?

A. I do not recall that detail.

R. X Q. 106. And that grain elevator afterwards exploded, did it not, and is now being rebuilt by the same contractor?

A. I do not know.

R. X Q. 107. How are you, then, in a position to state that the Witherspoon-Engler Company discontinued using the apparatus when, as a matter of fact, they were prepared to fight the suit vigorously, as I believe you practically admitted?

The Court: I understood him to say they took out a license.

Mr. Jones: No, this is something else. He was talking about Cincinnati. We are talking about Chicago.

By Mr. Jones:

R. X Q. 108. In other words, you really do not know anything about the circumstances of such alleged discontinuance, do you?

A. I know that any further equipment that this contractor used [fol. 229] he bought from a licensed manufacturer.

R. X Q. 109. But on that particular building, you have no information that justifies you in leading the Court to infer that they ceased using the apparatus because of that suit, do you?

The Court: He said that suit was discontinued.

Mr. Jones: The suit dragged for four years. As a matter of fact, they did not discontinue it.

The Court: It was then dismissed, and the suit discontinued.

Mr. Jones: The building was finished long ago.

The Court: It was his understanding that the party would not further infringe, and as far as he knows, since that time they have not further infringed, because they have bought their apparatus from a licensee since. Is that true?

The Witness: Yes, sir.

Mr. Jones: But in that particular suit, where I was the attorney, they did not discontinue the apparatus until they got through with it. Of course, they did not have to use it very long. It does not take very long to pour concrete.

(At 12.30 P. M. a recess was taken until 1.30 P. M.)

1.30 p. m.

Present: Parties as before noted.

Mr. Hood: Your Honor, in closing our prima facie, we offer this stipulation which is as follows:

It is hereby stipulated and agreed by and between the counsel for the respective parties hereto, for the purposes of this case only, that [fol. 230] plaintiff, Concrete Appliances Company, is the sole owner of Letters Patent No. 948,719, as alleged in the bill of complaint.

This stipulation contained the further provision that regular printed copies, uncertified, of United States and foreign patents may be offered and received in evidence by either party.

There is a further stipulation, also, that as to foreign patents photostat copies obtained from the United States Patent Office may be used instead of printed copies; that foreign copies shall be effective as of the date of issue, which in the case of British patents is considered as the date of acceptance, and that United States patents shall be considered as evidence of knowledge by others as of the date appearing upon the face of the printed copy, indicating the filing date of the application.

(Plaintiffs rest.)

(Defendants outline contents of their printed depositions.)

(Adjourned until Tuesday, October 4, 1921, at 10 A. M.)

[fol. 1] IN UNITED STATES DISTRICT COURT

[Title omitted]

Depositions de bene esse taken on behalf of defendants in the above-entitled cause, before Annie C. Courtenay, notary public, pursuant to attached notice, at the offices of Messrs. Sheridan, Jones, Sheridan & Smith, suit 1532-36 Marquette building, 140 South Dearborn street, Chicago, Illinois, commencing at 10 a. m. Monday, December 20, 1920.

Present: Arthur M. Hood, Esq., of Hood & Schley, Indianapolis, Indiana, for plaintiffs; and George Bayard Jones, Esq., of Sheridan, Jones, Sheridan & Smith, Chicago, Illinois, for defendants.

FOUNT M. WOODWARD, a witness produced, sworn, and examined on behalf of defendants, deposes and testifies as follows in answer to interrogatories by Mr. Jones:

Q. 1. Please state your name, age, residence and occupation.

A. Fount M. Woodward; 42 years; 306 N. Vernon Avenue, Brookfield Illinois. I am superintendent for McNulty Bros. Company.

[fol. 2] Q. 2. Are you familiar with any instances of the use of chutes or pipes for distributing concrete? If so, state the circumstances.

A. In the year of 1907 they used sheet metal pipes, wood hopper for the distribution of concrete on the American Hotel and Theatre Building at the northeast corner of Seventh and Market Streets, St. Louis, Mo.

Q. 3 What was your business at that time?

A. I was superintendent of the Roebling Construction Company.

Q. 4. How did you happen to be familiar with this work you speak of?

A. The company I was with used the concrete fireproofing, and also furring and lathing; and it was my duty to employ concrete foremen and do the work as cheaply as possible; and I was interested in any new machinery, methods or scheme of doing concrete fireproofing.

Q. 5. Did you personally see the apparatus you have referred to?

A. Yes, sir. The company I was with made a bid on the fireproof floors, column and girder covering, but was not the successful bidder. The work was within four blocks of our office, and in watching the progress of the building I noticed a new method and went in to investigate. At that time they were distributing concrete on the mezzanine floor of the hotel section. After this concrete work had been let the company I was with secured the contract for the furring and lathing of this American Hotel and Theatre Building. It is customary, and also essential, to place hangers in the concrete floor slabs to support the construction of suspended ceilings, false beams, cornices, &c. I visited this job as the different floors were installed, showing the men where and how to place the hangers, up to the time the roof of the theatre was concreted.

[fol. 3] Q. 6. About how often and over how long a period did your visits to this building continue?

A. At first I visited the building at intervals of from ten days to two weeks, until we started the furring and lathing, and then I visited the building almost daily. I visited the building from the sumer of 1907 till Thanksgiving of 1908.

Q. 8. About when would you say the use of pipes for distributing concrete on this building began?

A. The spring of 1907. They continued in use until the first of January, 1908.

Q. 9. How many of the floors were poured in this manner?

A. All the floors up to the fourth floor were poured in this manner. This was the level of the theatre roof.

Q. 10. Please describe more fully the apparatus used in distributing the concrete, beginning with the mixer.

A. They had a batch mixer, and a platform built around this mixture, and the aggregate, that is, the stone and sand was brought up through a hopper that fed this mixture. They operated a self-dumping concrete bucket, which was raised through a hoisting tower, of wood construction, situated on the end of the building on the Seventh St. side. This self-dumping bucket dumped the concrete into a hopper several floors or several feet higher than the place from which the concrete was to be distributed. They were round sheet metal chutes, connected with this receiving hopper, and down through the skeleton framework, and at different angles or incline from the concrete passed through these chutes, which were supported by pieces of wood made in X-shape and by wire hangers from the structural members of the steel framing.

Q. 11. About how far would the concrete flow through the chutes?

[fol. 4] A. Different days I would see the chutes different lengths. When they poured the mezzanine floor of the hotel portion the concrete was carried through the chutes a distance of sixty feet, that is, from the time it left the self-dumping bucket.

Q. 12. State what parts of the chutes were supported by wire hangers and what parts by the wooden supports.

A. It seemed that the wire hangers were used where they had a beam or girder to put the wire over.

Q. 13. How was the lowermost section of the pipe usually supported?

A. By a wooden brace made in the shape of an X, and right at the mouth of the chute it had what is commonly called a horse, that is a piece of wood with four legs which stands alone.

Q. 14. If they wished to deposit the concrete in a different place, what would they do?

A. Change their chutes. They put on a short chute, or took off a length of the chute they were using.

Q. 15. Were they able to change the angle in any way?

By Mr. Hood: Objected to as leading.

A. Yes, they changed the angle to any direction, except upwards.

Q. 16. What kind of connection was provided between the successive lengths of pipe?

By Mr. Hood: Objected to as assuming and leading.

A. I don't really remember enough to go into detail about it.

Q. 17. Do you remember whether they were able to change the angle between adjoining sections?

By Mr. Hood: Objected to as assuming.

A. No.

Q. 18. You referred to concrete passing through chutes a distance [fol. 5] of sixty feet. In a case like this, would the chute be a single chute 60 feet long, or how would it be constructed?

A. As I remember the construction of the chutes, they were the length of possibly eight or ten feet, with some kind of a band or wrought-iron collar at the connecting end.

Q. 19. You have previously referred to your interest in new methods or schemes in connection with this American Theater Building. Explain what struck you as new in this connection.

A. The saving of labor; in fact, the whole operation was new from the old practice of a wheelbarrow hoist.

Q. 20. Did others show any interest in this new method?

A. Yes, sir. I had taken it up with the manager of the company for which I worked and on his next visit to St. Louis he visited the job.

Q. 21. Who was this?

A. Mr. Andrew W. Woodman. At that time he was manager of the Roebling Construction Company, of what was known as the Chicago office, and lived at Evanston, Illinois.

Q. 22. Was this building of interest to people generally?

A. I don't understand your question; naturally it would be, from different standpoints.

Q. 23. Please explain more fully why it would naturally be of interest, from the standpoint of a building constructor.

A. Up to this time the engineering profession, as a rule, objected to using concrete, as we termed "sloppy concrete." There were some interested—myself included—on seeing the condition of the work after the concrete had been placed by this method.

[fol. 6] Q. 24. Were there visitors to the job besides Mr. Woodman?

A. Yes, I had an engineer from the Westlake Construction Company's office, by the name of Woodyard, who was very much interested in concrete construction, and visited the job with me several times.

Q. 25. State, generally, whether you saw any other visitors on the job.

A. Yes, I saw quite a number of different contractors, and foremen, on the job at different times.

Q. 26. You have stated that the concrete hopper was higher than the place where the concrete was being distributed. As the concrete work on the building got higher, what was done with the hopper?

A. It was placed at a higher level.

Q. 27. What was done with the pipes or chutes?

A. They were taken up and used the same as they were below.

Q. 28. Of what were the floors made?

A. I don't understand your question.

Q. 29. I understand that this was a steel skeleton building from your previous answers, and that a number of floors were provided, as the building was at least several stories high. Of what material was these floors made?

A. Reinforced concrete slab.

Q. 30. How much of each floor area was formed by discharging concrete through the chutes to which you have referred?

A. Practically the entire floor area, with exception of where the hoist went up through the building.

Q. 31. I show you what purports to be a photograph of a page of the St. Louis Republic of Sunday, February 16, 1908, headed, "New American Theater Opening Tomorrow, Is Model of Handsome and Safe Playhouse Construction." Can you identify this full page article and the illustrations as the building to which you [fol. 7] have been referring?

A. I can identify the photograph of the American Theater Building, St. Louis.

Q. 32. Please read the paragraph entitled "Novel Feature," and explain a little more fully what is referred to therein.

A. I think the article explains itself.

Q. 33. That is, it refers to the concrete-distributing chutes which you have been testifying about; is that it?

By Mr. Hood: Objected to as leading.

A. Yes, sir. There is one thing wrong in that article which is not so, that is, it states the floor slab was reinforced by inch and a quarter bars.

Q. 34. As I understand your testimony thus far, the concrete was discharged from a mixer into a self-dumping bucket, which was raised through a hoisting tower to a point higher than where it was required, and was then dumped automatically from the bucket into a hopper, from which it flowed through a series of downwardly-inclined pipes to its final position, and that the hopper was raised from time to time as the building became higher, the pipes also being raised so that the upper end would receive concrete from the hopper in any of its different positions, and the lower end would discharge the concrete to any part of the floor area. Is this understanding correct?

A. Yes, sir.

Q. 35. Who was reputed to be the originator, inventor or the party otherwise responsible for the use of this apparatus for distributing the concrete?

A. The day that I first visited the job, I met a superintendent of the Gilsonite Construction Company, a man that I had known by the name of Bankes. I asked him, "Bankes, whose idea is this?" and he said it was his own. I said, "How long have you had it, [fol. 8] Bankes?" He said, "I have had it quite a while, but you

know how hard it is for us fellows to tell people in the office anything."

By Mr. Hood: The reported conversation with Mr. Bankes is objected to as incompetent.

Q. 36. Did you discuss with anyone else the question of the novelty of this apparatus?

A. Yes, I talked it over with the engineer for Roebling, and I went to see the Gilsonite Construction Company, and asked them if it had been patented.

Q. 37. What did you learn?

A. They told me "no," it hadn't been.

Q. 38. Was there any further discussion?

A. Yes, this man I was talking to seemed to think that the idea was as old as the hills—he didn't see where there would be any grounds for application for patent.

By Mr. Hood: The report of alleged thoughts of an unnamed person are objected to as incompetent.

Q. 39. In your last answer, were you referring to the Roebling engineer, or someone connected with the Gilsonite Construction Company?

A. It was the estimator for the Gilsonite Construction Company.

By Mr. Hood: Last objection repeated.

Q. 40. By whom was Bankes employed, if you remember?

A. By the Gilsonite Construction Company, on the American Hotel & Theater Building.

Q. 41. Do you know whether Bankes tried this apparatus prior to the time it was used on the American Hotel & Theater Building?

A. I do not.

Q. 42. Do you know whether he proposed using it earlier?

[fol. 9] A. I do not.

Q. 43. I show you a photograph having two views marked "A" and "B," and ask if you can tell what structure is shown therein?

A. No, I cannot.

By Mr. Jones: The Notary is requested to mark the photograph of the St. Louis Republic, in order to identify it later, as "Defendant's Exhibit 1, Photograph of St. Louis Republic;" and to mark the photograph just referred to as "Defendant's Exhibit 2, Photograph A-B of Canadian Suit."

Mr. Hood is reminded that the photograph of the St. Louis Republic was filed in opposition to the motion for preliminary injunction in August, 1920, accompanied by the affidavit of a librarian, Clarence E. Miller, St. Louis, and is asked if he wishes to stipulate that this photograph is a reproduction of the paper in question, published February 16, 1908.

By Mr. Hood: It is stipulated by counsel for plaintiffs that if Clarence E. Miller were called and examined as a witness for defendants he would testify that he is a resident of St. Louis, Mo.; a

librarian connected with the Mercantile Library of that city, and familiar with its files since October 1, 1900; that on or about February 16, 1908, a copy of the St. Louis Republic was placed in the files of said Library; and that the photographic copy offered in this case as "Defendants' Exhibit 1" is a true and correct copy of one page of said issue of the St. Louis Republic of February 16, 1908. Plaintiffs' counsel does not object to the secondary character of the exhibit.

Q. 44. Do you recall anything about the construction of the St. Louis Coliseum?

A. Yes, sir. It was constructed at the southwest corner of Jeffer-
[fol. 10] son and Washington Sts., by the C. L. Gray Construction Company, in the year 1908. It was a fire-proof balcony, a semi-steel structure with concrete floors.

Q. 45. How was the concrete distributed?

A. They built a high concrete tower, which was braced with cables used as guy lines. The concrete was hoisted in concrete buckets, which were emptied into a hopper and distributed through chutes.

Q. 46. I show you four pages from a catalogue of the Gray Construction Company, filed in opposition to the preliminary injunction motion, and will ask if you can identify any of the structures illustrated therein.

A. That is the Coliseum, St. Louis.

By Mr. Jones: The Notary is requested to mark these two sheets (4 pages) "Defendants' Exhibit 3, Cuts of St. Louis and Des Moines Coliseums."

Q. 46a. Did you personally see the Coliseum while it was being erected?

A. Yes, sir.

Q. 47. Did you visit the roof of the American Theatre Building when it was nearly completed, as far as the concrete floor slabs were concerned?

A. No, sir.

Q. 48. Did you see the Coliseum more than once while it was being erected?

A. I saw the Coliseum several times—I saw the concrete operation, the concreting of the balcony; and I saw the job after the concreting was completed.

Q. 49. Were any wheel-barrows or carts used in distributing the concrete to the different floors of the American Theater Building?

By Mr. Hood: Objected to as incompetent.

A. Not to my knowledge.

[fol. 11] Q. 50. Prior to the use of the sloppy or wet concrete used in building the American Theater Building, what kind of concrete was generally employed?

A. Most engineers and architects specified the different mixes. The Roebling Construction Company, for which I worked, advocated

using concrete with only enough water added that when the floor slab had to be tamped, the water would rise to the top of the slab.

Direct examination closed.

Cross-examination by Mr. Hood:

X Q. 51. How do you fix the time as the spring of 1907 when you first saw the apparatus which you have described in use in the construction of the American Hotel & Theater Building?

A. The Roebling Construction Company had their office in the Victoria Building, St. Louis, Mo., until January 1, 1908. I estimated the furring and lathing, and we completed our work in the theater portion of the American Hotel & Theater Building while our office was located in the Victoria Building.

X Q. 52. How do you fix the time as the spring, instead of the summer or fall?

A. Our work of the furring and lathing took sixty days to complete, and we were completed in the theater portion the early part of December, 1907. It takes the work of setting steel and concreting up to the five floors which covered the theater portion, in my judgment, took ninety days or more, which is my basis for placing the time as the spring of 1907.

X Q. 53. From July 1, 1907, to December 1, 1907, would give a period of ninety days for erection of frame and placing of concrete, and a subsequent sixty-day period for placing furring and lathing, would it not?

A. It would.

[fol. 12] X Q. 54. Then it is your recollection that the work of erection of the frame of the American Theater Building began about July 1, 1907, isn't it?

A. No, sir. My recollection is that it began in the spring.

By Mr. Jones: It is our intention to establish the dates later by records from the architect's office.

X Q. 55. You are depending on your memory for fixing these dates, are you?

A. Not altogether. I have an old time-book with the time of our lathers on the American Hotel & Theater Building, which was Roebling's contract L-390. In that book the time of the men, starting in 1908, refreshes my memory, as the two men working at that time were men working in the hotel portion.

X Q. 56. You don't remember distinctly the details of construction of the apparatus which you used for placing the concrete in the American Theater & Hotel Building, do you?

A. No, sir.

X Q. 57. Nor do you remember the details of construction of the apparatus which you say was used in placing the contract in the St. Louis Coliseum, do you?

A. No, sir.

Deposition closed.

Fount M. Woodward.

ANDREW W. WOODMAN, another witness produced, sworn, and examined on behalf of defendants, deposes and testifies as follows in answer to interrogatories by Mr. Jones:

Q. 1. Please state your name, age, residence, and occupation.

A. Andrew W. Woodman; fifty-four years; Evanston, Illinois. I am a civil engineer.

[fol. 13] Q. 2. What experience have you had in the design or erection of buildings?

A. I have been a builder of structural steel, of fireproofing and reinforced concrete, and also of complete buildings from 1899 to 1909. I was district manager of the Roebling Construction Company, whose business was fire-proof building construction. From 1909 to 1914 I was a contracting engineer, building industrial and power plants of brick, steel, and reinforced concrete. From 1914 to 1920 I was a builder of bridges in structural steel, the bridge work including reinforced concrete bridges as well as steel bridges.

Q. 3. Are you familiar with the methods used in the construction of the American Theater & Hotel Building in St. Louis, with particular reference to the concrete work?

A. In a general way, yes. As I recall, some time during 1907, at which time I was the western manager of the Roebling Construction Company, making a specialty of concrete fire-proof building construction. I had an office in the City of St. Louis, and made periodical visits to that city. On one of my visits, during the open building season of 1907, as I recall the date, on visiting the office at St. Louis, my attention was called by our local superintendent, Mr. Fount Woodward, to a novel system of distributing the concrete which was being placed in the reinforced concrete floors of a building in the heart of the business district of St. Louis, this building being known as the American Theater, as I recall the name. I visited this building with Mr. Woodward, and examined the equipment which was being used for distributing the concrete, and observed that this equipment consisted, in general, of the following: a concrete mixer placed in the basement, delivering concrete in a comparatively wet form to a skip hoist, which, in turn, carried the concrete, by [fol. 14] way of an elevator extending to a point above the top of the building, to a receiving hopper at or near the top, there dumping the concrete into a system of closed pipes made of sections, these sections being hung and supported to the structure, the concrete being delivered at the lower end of the last section of pipe to the floor where concreting operations were being carried on.

Q. 4. Was the concrete deposited into wheel-barrows, carts, or forms?

A. The concrete was delivered directly to the wood forms without the intervention of wheel-barrows.

Q. 5. Will you kindly make a rough pencil sketch illustrating the apparatus you have described?

A. I hand you this sketch as indicating in a general way my recollection of the arrangement of the concrete distributing equipment in this building.

By Mr. Jones: The notary is asked to mark this sketch "Defendants' Exhibit 4, Woodman Sketch of American Theater Building."

Q. 6. Please state how the pipes were hung from the steel structure.

A. As near as I can recall, the pipes were hung to the steel frame by means of wires or light cabels, and the last section of pipe, through which the concrete was delivered directly to the wood forms, was connected to the preceding section by means of a flexible joint, and the lower end of this section rested upon a wooden horse.

Q. 7. About how far did the concrete flow through these pipes?

A. At the time I visited the building the concrete was passing through this series of pipes for a distance of perhaps sixty to a hundred feet. It is my recollection when I visited this building [fol. 15] with Mr. Woodward that concrete was being placed through this system of pipes on the fourth or fifth floor, and that the top of the tower elevator was located at a point above the eighth, ninth, or tenth floor, so that the journey of the concrete from the time it was dumped from the skip carried the concrete through four or five stories in the height of the building.

Q. 8. Have you seen any photographs or descriptions of this building in the last ten or twelve years from which to refresh your recollection, or are you testifying from your recollection of what you saw about thirteen years ago?

A. I am testifying from recollection, and, if my recollection is correct, at the time of this visit I requested Mr. Woodward to endeavor to take some photographs of the equipment; and, if I recollect correctly, Mr. Woodward did get one or more photographs which were used at the time as a basis for discussion of this particular method of concrete distribution by the General Manager of the Roebling Construction Company and myself. If such photographs were obtained, as I think they were, these photographs would have automatically passed out of my possession in October, 1909 at which time I severed my connection with the Roebling Construction Company.

Q. 9. About how long were the sections of pipe?

A. I would say about six or eight feet.

Q. 10. About what diameter?

A. I would say about eight inches.

Q. 11. When it became necessary to change the point at which the concrete was being distributed, what was done?

A. During the time that I was visiting the building, it is my recollection that the distributing end of the chute was not moved.

Q. 12. From your observation as an engineer, what would you say [fol. 16] as to the manner in which they were moved when such movement became necessary?

A. It being my recollection that the delivery section of the chute being connected to the adjoining section by means of a flexible joint, the process of changing the point of delivery would consist of first moving the supporting horse to the point where delivery was desired, and then swinging the delivery sections of the pipe about the flexible joint at its upper end as a pivot.

Q. 13. What did you learn as to the method employed where it was necessary to distribute the concrete at a point perhaps fifty or more feet away?

By Mr. Hood: Objected to as incompetent, in view of the previous testimony.

A. Inasmuch as the visit which was made by Mr. Woodward and myself was a private visit, and we were not accompanied by a representative of the contractor who was handling the work, I can only state the method which I, myself, would pursue with this particular equipment, and such method would consist of adding a sufficient length of pipe to the point in question and so adjust the entire run of pipe sections as to permit the wet concrete to flow properly by gravity.

Q. 14. From what you learned from an inspection of this apparatus, what would you have done to distribute concrete to the different floors as the building became higher to deposit the concrete over the entire floor area?

A. I would first determine whether the tower had adequate height to allow the distributing system through all its length to have suitable pitch, so as to permit of the proper flow of the concrete, through the pipes, and if the tower was not sufficiently high I would then increase the height of the tower, so as to give the proper gradient to the [fol. 17] pipe system, in order that the concrete might flow by gravity to the most remote point on the highest floor.

Q. 15. Assuming that the hopper in your sketch remained at a fixed height, and that you wished to distribute concrete to a higher floor, what other method would you adopt if you found that adding further lengths of pipe made the slope too gradual?

A. If it should be impossible to raise the tower to a greater height, I would then deliver the concrete through the pipes with wheelbarrows or buggies located as remote from the tower as the relative position of the hopper and the floor being concreted would permit.

Q. 16. In answer to Q. 13 you stated that to change the point of delivery you would add a sufficient length of pipe to the point in question, and so adjust the run of pipe sections as to permit the concrete to flow. Explain what you mean by "adjust the run of pipe."

A. What is meant by "adjusting the runs of pipe" is the arrangement of the sections of pipe between the hopper at or near the top of the tower, and the last or lower section of pipe, which I have designated as the delivery section.

Q. 17. Please state what you or your workmen would do in making this so-called adjustment.

A. The amount of changes to be made in the delivery pipe would be regulated by the nearness or the remoteness of the point of delivery upon the floor to the elevating tower, and if delivery were required on any given floor close to the tower, this might involve removal of one or more sections of pipe, whereas if delivery were to be made at a point of the floor remote from the elevated tower, this might require the insertion of additional sections of pipe.

Q. 18. In other words, you would either lengthen or shorten the sections of pipe as the occasion demanded; is that it?

[fol. 18] A. That is correct.

Q. 19. You have stated that the concrete was comparatively wet. What was the prevailing practice at that time with reference to the consistency of concrete?

A. The general practice which was followed in making concrete, as known to me at that time, was to use only a moderate amount of water in the mixing of the concrete, so that the resulting mixture was comparatively dry. After placing the concrete in position it was the general practice at that time, as known by me, to tamp the concrete until the water in the mixture flooded the surface of the concrete.

Q. 20. Did this practice that you speak of continue after it became customary to embed vertical reinforcing bars in the concrete, as in columns, for example?

A. My observations upon the art and practice of making and placing concrete in conjunction with reinforcing steel showed a distinct tendency to increase the amount of wetness of the concrete mixture, in order to ensure the more complete coating of the reinforcing steel with the grout in the concrete, the object of this being to derive a resultant so-called reinforced concrete, in which the reinforcing steel would be in intimate contact with the body of concrete throughout the entire length of the reinforcing bars, and over their entire surface.

Q. 21. About when did reinforced concrete come into widespread use, as distinguished from heavy foundation work without reinforcement?

A. As far as my personal knowledge goes, the first attempts that were made to disseminate specific knowledge concerning reinforced concrete, and to bring about its introduction into general building work, were made in the early nineties.

Q. 22. About when did it come into widespread use, more par-

[fol. 19] ticularly in tall buildings, as distinguished from low structures?

A. My personal knowledge of the application of reinforced concrete to building construction indicates that the earlier applications of reinforced concrete to buildings consisted of the construction of short span concrete floors supported on a steel framework; and this method of construction had become fairly general as early as 1900, this floor construction consisting of reinforced concerte. As I recall the development of the industry, structural reinforced concrete, by which I mean the building of columns, girders, and beams, as well as the building of reinforced concrete floors, became quite general between 1900 and 1905, and had become a very general practice by about 1910 or 1912. It is my recollection that at or about 1905 there was built in the City of Cincinnati a reinforced concrete building, in which all of the parts were reinforced concrete. This building, as I recall it, was twelve, or fifteen, or sixteen stories high, and, as I remember discussions at that time of the subject, many people in the building industry expressed amazement at the

application of reinforced concrete to the structural parts of so high a building. So far as was known to me, however, this building was a success structurally, and with the passing of time it became more or less general to build what was commonly described as tall buildings using reinforced concrete construction throughout. The use of the term "tall buildings" does not apply, however, to such structures as the Metropolitan Life Insurance tower, the Singer Building, and the Woolworth Building.

Q. 23. You have stated that the increasing use of reinforcing steel in the concrete resulted in the use of more water in the concrete [fol. 20] mixture. What effect, if any, did the development of the forms themselves have on this evolution toward wet concrete?

A. When it was the practice to make concrete in what is known as a dry mixture, it was the general practice to use square-edge lumber for forms, and as the wetness of the concrete was increased, for the purpose of improving the bonds between the reinforcing steel and the concrete, it became the practice to use matched lumber in the forms in order to avoid the loss of cement grout from the wet concrete by the grout washing out through the joints in square edged lumber.

Q. 24. Was this improvement in the forms a sudden or a gradual development?

A. A gradual development.

Q. 25. Was the evolution of wet concrete a sudden or a gradual one?

A. So far as my observations go, the evolution of wet concrete was gradual, as many architects and engineers for a long time evidenced a desire to adhere to the earlier established methods of making concrete of a comparatively dry mixture.

Q. 26. About how many times did you inspect the apparatus on the American Theater Building?

A, Only once.

Q. 27. Was there much or little comment regarding the novel apparatus used on the American Theater Building?

A. I can only answer that question so far as my associates and myself are concerned. We discussed the matter at considerable length, but did not consider it wise at that time to abandon the system of wheel-barrow and buggy deliveries, which we were then using.

Q. 28. Are wheel-barrows and buggies still used today?

A. The only answer I can make to that question is to state that [fol. 21] in passing about from place to place and casually observing construction work as it is being carried on is to me somewhat of a surprise to note the almost universal use of the tower-distributing system. I could not state, however, that wheel-barrows and buggies are not used.

Q. 29. Are you in the concrete business today?

A. I am not.

Q. 30. For how many years have you been out of touch with it?

A. I have been out of touch with concrete construction business for about four years.

Q. 31. I take it, then, that what you mean by your observations of tower-distributing systems is that where they are used they are very conspicuous structures, whereas the use of other apparatus is less easy to see from a casual observation; is that correct?

A. That is correct.

Direct examination closed.

Cross-examination by Mr. Hood:

X Q. 32. Do you recall the time in the year 1907 when you inspected the apparatus at the American Theater & Hotel Building in St. Louis?

A. As I stated, it is my recollection that the inspection of the American Theater Building was made by me during the time that is known as the "open building season." I particularly remember that the day was a bright, sunny day.

X Q. 33. Do you think it was somewhere along about June or July?

A. I am more inclined to think that it was in August, for I have a vague recollection that it was reported that the owners were anxious to have the theater completed as early as possible.

[fol. 22] X Q. 34. At what floor level were they depositing concrete?

A. It was my recollection, as previously stated, that my inspection was made on about the fourth or the fifth floor.

X Q. 35. Do you recall the details of construction of the flexible joint which you have mentioned?

A. I do not recall the specific details of the flexible joint, the point which I do recall is that the connection at the upper end of the delivery section of pipe to the upper sections of pipe was so made that the delivery section could be swung.

X Q. 36. And how was this flexible joint supported?

A. It is my recollection that this was supported by wire or cable to the steel frame overhead.

X Q. 37. Then, the chute sections were threaded down through several stories of the steel framework of the building; is that right?

A. That is my recollection.

X Q. 38. During the past few years, as you have gone about the country, has your attention generally been arrested by reinforced concrete buildings under construction?

A. Because of my connection with the building of reinforced concrete construction, extending over a period of about fifteen years, I have a natural interest in such construction, and, consequently, am generally inclined on seeing work of such character being performed to observe with a greater or less degree of care the methods being pursued, and with the passing of time have noted that whereas when chutes were first used the inclination of the chute was quite steep, these chutes as now installed are far less steep than formerly.

[fol. 23] X Q. 39. You still possess the ability to note, in passing

construction work, the general character of the methods of fabrication in use, do you not?

A. I believe so.

Deposition closed.

Andrew W. Woodman.

Adjourned until Tuesday, December 21, 1920, at 10:30 A. M.

December 21, 1920.

Parties met pusuant to adjournment. Present as before.

Leopold J. Mensch, a witness produced, sworn and examined on behalf of defendants, deposes and testifies as follows in answer to interrogatories by Mr. Jones:

Q. 1. Please state your name, age, residence and occupation.

A. Leopold J. Mensch; 48 years; 2929 Michigan Avenue, Chicago, Illinois. I am a contracting engineer.

Q. 2. Please state more fully the character of your business, and refer to some of the structures which you have built.

A. My business is the design and construction of reinforced concrete engineering works and buildings. Amongst the larger buildings and structures I was connected with are the Pugh Building in Cincinnati, a ten story building, in 1903; the plant of the Utah Copper Company in Garfield, Utah, in 1906; the Rocky Mountain Bell Telephone Company's Building, and the Utah Trust & Savings Building in Salt Lake City in 1906; the Seamons Bank Building in San Francisco in 1908, the Masouic Temple in Toledo in 1903; the Proctor & Gamble plant in Armourdale, Kansas, in 1903; two buildings for A. J. O'Leary & Son Company at Lake and [fol. 24] Desplaines Sts., Chicago, in 1910 and 1912; Rasmussen Company's Warehouse, Crosby St., Chicago, 1919; and the plant of the St. Louis Coke & Chemical Company, at Granite City, Illinois, in 1920, and many others.

Q. 3. Are you a member of any engineering organizations?

A. I am a member of the American Society of Civil Engineers, of the American Society of Testing Materials, and of the American Concrete Institute, and was actively contributing to the transactions issued by these societies.

Q. 4. Are you familiar with any of the work done on the Ingalls Building in Cincinnati?

A. Yes, sir.

Q. 5. State briefly what connection, if any, you had with it?

A. I was the man who first proposed to build this building of reinforced concrete, the intention having been to build this building of steel construction. I had at that time an office in Cincinnati, I think in the Union Trust Building, and the contract for the construction of the building was awarded to the Ferro-Concrete Construction Company, and they, starting in business with that particu-

lar building, had not had much experience in concrete construction, and I naturally watched the progress of the construction with interest. Towards the end of 1902 I had a visitor from New York (who now lives abroad), and he being also very much interested in concrete construction, we climbed to the second or third floor of the building while they were doing the concreting of the second or third floors, and I noticed that they were just finishing up the concreting of that particular floor around the portion of the building where the hoisting tower was located; and I noticed also that they used metal chutes [fol. 25] from the concrete hopper, which chute in my estimation was about 18 inches wide and possibly 8 inches deep, and maybe 16 feet long, and I saw that the end farthest away form the tower of the chute was held by a rope, or two ropes, fastened to the top of the tower and to the end of the chute, and one man was moving said chute back and forth a few feet while the concrete was running out of the end of the chute. I also noticed that they used a great deal of surplus water in doing so, and that a great portion of the floor was covered with water.

Q. 6. As I understand your answer, the apparatus consisted of a tower, with some kind of concrete hoisting apparatus in it, a hopper fastened to the tower, and a length of chute connected to the hopper at its upper end and freely suspended by a rope or ropes connecting the upper part of the tower with its outer end, so that it could be swung through an angle from one side to the other to vary the point of distribution of the concrete; is that correct?

By Mr. Hood: The question is objected to on the ground that it contains statements of details of construction which are not in any way referred to by the witness, and therefore leading.

A. That is so.

Q. 7. I hand you a photograph of a building under erection, and will ask if you can identify it. If you can, state how you identify it.

A. I think it is a photo of the construction of the Ingalls Building. I remember the advertisements on the walls, and I remember the sign, "The Pike," on the building opposite. I have forgotten what this sign referred to.

By Mr Jones: The notary is asked to mark this photograph "Defendants' Exhibit 5, Photograph A of Ingalls Building."

[fol. 26] Q. 8. I hand you another photograph marked B, and will ask if you can identify the structure in it.

A. That seems to be the second floor of the Ingalls Building. I remember the chute and the hopper, and the tower work and signs on the wall.

By Mr. Jones: The notary is asked to mark this photograph "Defendants' Exhibit 6, Photograph B of Ingalls Building."

Q. 9. At the time you saw the apparatus of photograph B, was the outer end of the chute supported by the X-shaped horse or brace shown in the picture?

A. No, I saw the floor a few days later.

Q. 10. How do you know it was a few days later?

A. Because the steel is not placed on this floor, and it took them as a rule eight days to build a floor, so it must have been a few days after that I saw the floor.

Q. 11. Do you recall the names of any of the men engaged in the work of distributing the concrete?

A. I don't remember any of the workmen; I know only Mr. Culp, who was head carpenter, or superintendant, I can't recall now.

Q. 12. You have referred to the fact that the concrete was very wet; what was the prevailing practice at that time with regard to the amount of moisture in the concrete?

A. The concrete was supposed to be soft, like a thick soup, but shouldn't have had so much surplus water that it would stand on the floor.

Q. 13. What is the practice today in this regard?

A. The practice of real experienced men is to make the concrete soft; those who do not understand the laws governing the setting of concrete use very wet concrete, in order to reduce the amount of labor necessary for spading and distributing concrete.

Q. 14. I call your attention to a copy of the Engineering News [fol. 27] of July 30, 1903, particularly pages 90-97 thereof, and will ask if the Ingalls Building referred to therein is the one which you have been describing?

A. Yes, sir.

Q. 15. Please compare the illustration Fig. 14, on page 97, with "Defendants' Exhibit 5."

A. They seem to be the same picture.

Q. 16. Is wet concrete used more or less extensively at the present time than it was when the Ingalls Building was built in 1902-1903?

A. Wet concrete is a great deal more used today than formerly.

Q. 17. During what approximate period of years would you say that it came into extensive use?

A. Every year more contractors go into business, and the less experience they have the more they use wet concrete. The more reinforced concrete came into use, the more contractors used wet concrete; and I should say that from 1908 on very much the greater portion of construction work was done in concrete than before; hence, also, more wet concrete was used since that time.

Q. 18. I call your attention to a volume entitled, "Transactions of the American Society of Civil Engineers," Vol. LX, June, 1908, p. 494, and will ask if you are the L. J. Mensch whose comments are printed therein?

A. Yes, sir, the statement includes the following:

"The statement, that the McGraw Building is higher than heretofore considered practical, must be contradicted. The height of the Ingalls Building, in Cincinnati, is about 220 ft. above the basement, * * *."

This discussion was part of a paper on reinforced concrete work of the McGraw Building, presented at the meeting of the American Society of Civil Engineers at New York City, November 20, 1907. [fol. 28] The following extracts are taken from this publication, relating to the McGraw Building, West Thirty-ninth St., between Seventh and Eighth Avenues, New York, an eleven story building:

Page 453:

"The concrete work of the building proper was begun in the basement in September, 1906, and the concrete parapet walls on the roof were completed on April 15, 1907."

Page 454:

"All the construction work of the building was carried on from a high central temporary timber tower running from the basement to a height of nearly 75 ft. above the roof. This timber tower was 31 ft. square, and built with 10 x 10 in. yellow pine spliced corner posts properly braced. Each 10 x 10 in. corner stock carried a derrick boom 75 ft. in length. These derricks were first placed low down on the tower, and then raised from time to time to elevations required by the progress of the work. The booms were long enough to command the entire area of the work, and had a sufficient swing or reach to pick up material, including sections of the steel columns, delivered in the street, in front of the building, and put it in its proper permanent place. The hoisting engines were placed in the basement, and steel cables ran from them up to the derricks."

Page 455:

"The consistency of the concrete was very nearly or quite wet enough to be that termed semi-liquid, so that it was truly 'poured' into all forms for columns, walls, and floors."

Page 456:

"The quantity of water used (referring to the specifications for this building) shall be sufficient to make a wet or even semi-liquid concrete, so that it will readily run or flow into all the small spaces to be filled around all classes of steel reinforcement, whether in the floors or in the columns."

[fol. 29] Page 481:

" * * * all concrete was hoisted to each floor in buckets dropped through the elevator shafts to the mixers, which were in the basement and placed so as to dump directly into the buckets as they rested. The booms swung the buckets so that they could be

dumped exactly at the desired points, thus obviating the use of other hoists, hoppers, wheel-barrows, runways, &c. This method proved so effective that very often the cost of all labor on concrete for considerable quantities would not exceed 40 cents per cu. yd."

It is hereby stipulated that the foregoing extracts, except that from page 481, were published prior to November 20, 1907, and that the last extract, to-wit, from page 481, is a report of statements made by Mr. E. P. Goodrich at the meeting of the American Society on November 20, 1907, and was published at least as early as June, 1908.

Q. 19. Prior to the time you saw chutes used for distributing concrete in Cincinnati in 1902, had you ever seen chutes or pipes used for this purpose?

A. Yes, sir. I saw chutes used in 1895, in the city of Vienna. We used chutes in the United States in every building we built—short chutes, from the mixer to the hopper or to a bucket in every case in every building, and at the end of concreting each floor we used a chute from the hopper, a coal chute, possibly 10 ft. long. The last kind of chute was used because all planks for wheeling had to be removed, and there is no other practical way to finish out the concreting, except shoveling the concrete from near the hopper to about 15 ft. around the hopper.

Q. 20. Aside from the chutes you have referred to, have you had any experience or seen distributing apparatus used in connection [fol. 30] with docks or underwater construction? If so, describe such apparatus, as used prior to 1908.

By Mr. Hood: Reference to operations in Vienna objected to as irrelevant.

A. I came to the United States in 1900, from Paris; and since that time I saw chuting done in 1903 in the Masonic Temple at Toledo. As to dock work and underwater work, I know it is necessary to distribute the concrete by means of chutes or pipes from about 10 feet above the water to the lowest point the concrete has to reach; and these pipes are generally handled by cranes or derricks, which swing the pipe to the location where concreting is to be done. I haven't seen it in this country, but I have seen it in Europe; and I have also seen photos and descriptions of similar work being done in this country. It has been used in the Detriot tunnel.

By Mr. Hood: The statements of the witness relative to underwater work in this country are objected to as hearsay and secondary.

Q. 21. You have referred to the Masonic Temple in Toledo; can you produce a sketch of a concrete-distributing apparatus used on that building?

A. Yes. The Masonic Temple in Toledo is about 100x110 ft. in area, and is about 70 ft. high. In the center of the building a large tower was erected about 10 ft. square, heavily braced, and bolted together, and the tower was erected to a height of about 120 ft. On this tower, on diagonal corners, there were fastened two derricks, with a boom of about 50 to 60 ft. These derricks were used in the

first place for raising the concrete in buckets from the basement, the concrete being filled into the bucket from the mixer by small chutes. For the corners of the building we had to use another way to reach the concrete than by depositing the concrete direct from [fol. 31] the bucket. We had to set up a temporary hopper, into which the buckets were emptied, and from there we used two short chutes to reach the farthest corners of the building, as shown in shaded lines on one of the sheets.

Adjourned until 2 p. m.

Met pursuant to adjournment.

Q. 22. Could the boom be raised at its lower end, or was it fixed permanently in place?

A. It appears to me the boom was raised once, at its lower end.

Q. 23. Do you mean that you recall that it was raised?

A. Yes, sir.

Q. 24. Do you recall how the chutes and the hopper were moved from one corner to the other?

A. No, I haven't seen the moving of the hoppers and chutes, but I have seen the moving of everything else on the floor.

Q. 25. Do you mean that they moved everything else except the chutes?

A. No, I saw them moving steel rods on the floor and lumber, moving it from one floor to the other, so I assumed that the heavy hoppers and chutes were also moved by the derricks; the brick and stone were also moved by the derricks.

By Mr. Jones: The notary is requested to mark the photograph of page 97 of the Engineering News of July 30, 1903, as "Defendants' Exhibit 7, Photograph C of Ingalls Building," and to mark the two sheets of sketches as "Defendants' Exhibit 8, Sketches of Masonic Temple Apparatus."

Q. 26. About what percentage of all the concrete work being done at the present time in this country is carried out by the use of a series of chutes, as distinguished from concrete deposited from carts, cars, buckets and other equipment?

[fol. 32] By Mr. Hood: Objected to as incompetent, the witness not having been shown to have knowledge of all the concrete work carried on in the country.

A. You mean what I saw myself?

Q. 27. I mean, from your experience in work of this character, what would you estimate to be the proportions referred to?

A. From five to ten per cent is done by chuting instead of wheeling or carting.

Q. 28. Do you consider yourself well informed on this subject, and to what extent have you kept in touch with concrete construction developments, through observation, reading, and attendance at scientific meetings?

A. I am now twenty years in the concrete business exclusively in this country. I travel around the country a great deal. I have done business from coast to coast, am reading all the periodicals pertaining to concrete and civil engineering generally; and am always particularly interested in new constructions methods, and have attended most of the meetings of the American Concrete Institute, and the meetings of other engineering societies.

Q. 29. From your experience, what can you say as to relative cost of distributing concrete by use of the two general types of apparatus you have just referred to?

A. That depends somewhat on the nature of the work. If I have to build a structure near a railroad, and there is only room on one side of the railroad for storage of materials, and I have to build the building on the other side, chuting from a tower on one side of the railroad to a tower on the other side of the railroad, is the most practical and cheapest way of distributing the concrete; or if you have to span a deep cut or valley, chuting is the most economical way; otherwise in my experience chuting is considered dearer than distributing concrete by carts or dump cars.

[fol. 33] Q. 30. How do you account for the expense of the chuting method?

A. It takes a very much heavier tower when you do chuting. It takes a heavier hoisting engine. You have to rely a great deal on a single man, who works under difficulties on top of the tower, when he releases the concrete into the chutes. If he is not very careful and knows his business well, concrete will accumulate at some point in the chute and slop over, and concreting often has to be stopped for hours at a time, while the wages of the men go on. Furthermore, if the man is not very skilled, the cement and sand will flow out first of the hopper on top of the tower, and then only the stone, poor in cement and mortar, is let out afterwards, and is conducive to poor concrete—and poor spots in the building or structure. You are also greatly dependent, when chuting, on the men at the mixer, who chute the concrete from the mixer into the hoisting box. If the mixture is a trifle too dry when it goes into the hopper, the concrete will not flow in the chutes, and delays of a quarter to half an hour occur to get rid of this dry concrete by some means, generally by dumping it from the tower to any convenient spot on the ground. Another disadvantage of chuting is that the chutes have to be cleaned, because a great deal of mortar and concrete accumulates at various points of the line, and it generally takes two or three good climbers to do this work in the evening, or when you stop concreting. These men are hard to get, and when you have them they generally do not want to do anything else. Another disadvantage of chuting is that you have to hoist the concrete a great deal higher than necessary, which slows up concreting a great deal, and it requires much more expensive equipment. In winter chuting ought to be absolutely prohibited, because the concrete, while it is flowing through the chutes, is very materially reduced in tempera-

[fol. 34] ture and arrives at the point where it is to be deposited in nearly frozen condition. The rigging up of the various contrivances

to do the chuting is very expensive, and unless the job is very large, will alone cost more, in my experience, than the entire cost of the concrete work by other means. The fact is, to my knowledge, the largest structures which have ever been built in this country have been built by using carts, and the lowest cost records have been made by using cars in opposition to chuting. I can mention one particular case in January, 1916, on a building at Ward St. and Diversey—my own building—about 150 ft. square, where I did the concreting from one corner of the building at a cost of 40 cents per cubic yard, including the heating of the materials and the melting of snow on the floor.

Q. 31. Are you familiar with the apparatus in Philadelphia which is alleged to be an infringement of the patent on which this suit is based?

A. No, sir.

Q. 32. Have you kept cost records, and have you knowledge of the records of other engineers and builders as a basis for your answer to Q. 30?

A. I don't know quite what knowledge you refer to. Yes, sir, I kept cost records of chuting, and of doing concrete work by other means; and from my knowledge of the facts, and I was the man who paid out the money in each case, I know what the relative costs are.

Q. 33. From your acquaintance with other men in the same business, and from your general knowledge of the art, would you say that you are alone in the opinions you have expressed?

A. No, I am not alone. To my knowledge the largest contractors in this country, for example, the Turner Construction Company of New York, and the Aberthaw Construction Company of Boston, [fol. 35] used up to this year carting nearly exclusively for distributing concrete, and if they ever used chutes, they did it to find out the relative cost, or to impress the owner with the great modern appliances they have to use to execute their work. Or if they lately used it, it may be for the reason that the former managers, who were well-informed about concrete work, do not take any more as active an interest in the construction work as they did formerly.

Q. 34. Did engineers and architects take readily to the use of wet concrete when it came into more general use about 1908, as you have stated?

A. No, sir, they considered it a necessary evil, and a joint committee of the American Society of Civil Engineers, of the American Society of Testing Materials, of the American Railway Engineers Association, and the National Concrete Institute very seriously considered to entirely prohibit chuting on any of the structures executed by their members.

Q. 35. About when would you say that the building of reinforced concrete buildings, meaning those with vertical reinforced columns as well as floors, began its period of expansion or wide general use in the United States?

A. I think in the year 1908 all-reinforced concrete structures came into use a great deal more than before.

Q. 37. What can you say with regard to these developments in the United States as compared with those abroad?

By Mr. Hood: Objected to as immaterial.

A. I should say that they were from ten to twelve years ahead in Europe in the art and use of reinforced concrete.

Q. 38. What relation did the increasing use of reinforcing bars [fol. 36] in concrete bear to the proportions of water employed?

A. More water had to be used in reinforced concrete than in plain concrete to make the concrete flow around the reinforcement without too much time being spent on making the concrete go around to the reinforcement, or fill the space within the reinforcement.

Q. 39. What effect, if any, did the San Francisco earthquake have on the concrete building industry?

A. It created a lot of reinforced concrete contractors, and while in San Francisco before the earthquake there were two or three concrete buildings, there were about two or three hundred reinforced concrete buildings two years after the earthquake.

Q. 40. What effect, if any, did the wide use of batch mixers have on the moisture in concrete?

A. It led to the use of wet concrete.

Q. 41. How do you fix the date when you did your work in Salt Lake City on the Utah Trust & Savings Bank and the Utah Copper Company's plant?

A. I was in Europe the winter of 1905-6, and went direct from Europe to Salt Lake City to start operations there.

Q. 42. What concrete distributing apparatus did you use on the Utah Copper Company's work?

A. Mostly carting, but for the construction of the ore bins I used a great deal of chuting.

Q. 43. Please prepare a rough sketch of this apparatus.

A. I have done so. The sketch shows the ore bins, which were about 30 feet wide and 300 feet long, and about 25 feet deep, and the location of the ground was such that the mixer had to be placed about 50 feet higher than the bottom of the bins, and about 30 feet away from the side of the bins. In order to convey the concrete [fol. 37] from the mixer into the bins, I used two chutes for a part of the concreting. One chute was about 40 feet long and reached from the mixer to about 6 feet from the side of and about 3 or 4 feet above the top of the bin. The other chute was a short chute which reached from the end of the first chute to the concrete floor, or the walls of the bin nearest to the mixer. For the part of the structure farther away from the mixer I used carts.

Q. 44. Were these chutes moved at all during the operation?

A. The short chute was moved, but not the long one—see dotted lines. The carts were filled from the end of the long chute. There was a little gate there.

Q. 45. Referring to the extract from page 481 of the Transactions of the American Society of Civil Engineers, previously referred

to, about how long after the meeting would that discussion have been published in accordance with the usual practice?

A. Two or three months.

By Mr. Jones: The notary is requested to mark the sketch produced by the witness "Defendants' Exhibit 9, Sketch of Utah Copper Company's Bins."

Q. 46. Was apparatus similar to that used on the Toledo Masonic Temple used on any other building?

A. I saw it used by the Ferro-Concrete Construction Company in 1904 at the American Book Company's Building in Cincinnati, near the Pugh Building, previously referred to.

Direct examination closed.

Cross-examination by Mr. Hood:

X Q. 47. Going back to your experience with the Ingalls Building in Cincinnati, of which you have testified, about how far was the point at which you saw the concrete being deposited from the tower [fol. 38] in which the hoisting bucket was arranged?

A. I should judge from 16 to 20 feet.

X Q. 48. How high was the hopper from the floor level?

A. I should say from 6 to 8 feet.

X Q. 49. Do you think it likely that the elevation of the hopper relative to any particular floor of the building would be changed from time to time during the distribution of concrete on that particular floor?

A. I don't think so.

X Q. 50. The hopper in that apparatus was a sort of inclined chute, about 6 *of* 7 feet long, wasnt it?

A. Yes, sir.

X Q. 51. And one end of that hopper was supported on the tower, while the other end was supported by a frame leg structure that rested on the forms for the floor that was being poured; is that right?

A. I cannot recall the support of the hopper at the farther end to which you refer.

X Q. 52. That hopper delivered at its outer end into a chute section that was about 8 or 9 feet long, didn't it?

A. Well, it appeared to me more than 9 feet.

X Q. 53. Do you recall just how the receiving end of that first chute section was supported with relation to the delivery end of the spout-like hopper?

A. No, I didn't notice that until I saw it today in the photo.

X Q. 54. Is the photo to which you have just referred either one of these two photographs which I now show you, and which are marked for identification, respectively, "Defendants' Exhibits 5 and 6"?

A. It is photo B.

X Q. 55. Now, Mr. Mensch, isn't it a fact that at the time when you specially noticed the photographs showing the mounting of

[fol. 39] the receiving end of the chute, you had in your hand another photograph which shows much more clearly than this Exhibit 6 the character of the mounting end of the receiving section?

A. I didn't look at that part of the picture. I had the photograph in my hand, though.

By Mr. Jones: The photograph referred to, not having been offered in evidence or referred to in the testimony, objection is made to consideration of it at this time.

By Mr. Hood: In view of the fact that the witness had this particular photograph, just referred to by counsel for defendant, in his hand during the taking of a portion of his examination-in-chief, and in further view of the fact that said photograph shows much more clearly the character of the construction under discussion, and was evidently taken at about the same time as the other two photographs which have been identified, counsel for defendant is asked if he is willing that said photograph be presented to the witness for identification, in order that it may be offered in evidence?

By Mr. Jones: For the purpose of fully advising the court of all the details of this apparatus, the photograph is marked for identification "Defendants' Exhibit 10, Photograph D of Ingalls Building."

X Q. 56. Do you recognize "Defendants' Exhibit 10" as a photograph of the Ingalls Building outfit, taken at about the same stage of progress of the work, or at least at about the same floor level, as "Defendants' Exhibits 5 and 6."

A. I recognize the picture as pertaining to the Ingalls Building, but I have not seen more than one chute used on the Ingalls Building, and this picture was evidently taken a few days previous to my visit.

[fol. 40] X Q. 57. In the three photographs, Exhibits 5, 6 and 10, how is the outer end of the first two sections supported?

A. Both photographs show an X support. Exhibit 5 appears to me to show that the outer end of the first chute was bolted to the next chute while Exhibits 6 and 10 show X braces were the support of the outer end of the first chute.

X Q. 58. Now, please examine Exhibit 5 through the magnifying glass, and see if it is not a fact that the view is taken looking directly along the line of delivery of the chute-like hopper, and that there is, extending towards the observer and in direct alignment with this hopper, a chute section, the delivery end of which is in position to deliver to what you have termed the "first chute section," and which is extended off to the right in a plane substantially parallel with the picture plane.

A. Yes, that is correct.

X Q. 59. So that this Exhibit 5 has a first chute section which is extended out from the hopper in line with the delivery line of the hopper in the same way as appears more clearly in Exhibit 6?

A. Yes, sir.

X Q. 60. What is your recollection as to the angle of inclina-

tion of this first chute section which you say you saw swung from side to side in delivering the moist concrete?

A. It appeared to me very steep, because I was standing in about the same position where the picture A was taken.

X Q. 61. What is your recollection as to the length of the hopper, that is, how far out from the tower did it extend?

A. About five to six feet, possibly a little more.

[fol. 41] X Q. 62. In these photographs 6 and 10 the outer end of the hopper is shown as supported by a wooden framework resting upon the forms for the contemplated floor of the building, is that right?

A. Yes, sir.

X Q. 63. And in Exhibit 10 the receiving end of the first chute section, beyond the hopper, is supported in a sort of wooden cradle; and immediately back of the delivery end of the hopper the receiving end of the first chute section is filled with some blocks or bricks; is that right?

A. Well, I can't state from the photograph whether the near end of the first chute section was supported by a cradle. It might have been.

X Q. 64. Exhibit 6 also shows the receiving end of the first chute section supported in a wooden cradle and also by a sling of cable, the upper ends of which are suspended from the upper end of the wooden legs which support the outer end of the hopper from the centering forms of the building; is that right?

A. Yes, sir.

X Q. 65. You have criticised to a considerable extent the use of chutes for distributing concrete in building operations under most conditions; and I gather from that that you are in general opposed to the use of chutes for distributing concrete in the fabrication of reinforced concrete buildings, if such use can be avoided. Am I correct in that assumption?

A. Where I can use other means at less expense, I will always avoid the use of chutes.

X Q. 66. Is it your opinion that in the fabrication of reinforced concrete buildings, where you have ample storage space adjacent the tower, it is always more economical to distribute the concrete over the different floor levels by carts, or dump wagons, or wheel-barrows, rather than by the use of chutes?

[fol. 42] A. It is my opinion that in most cases the use of carts and proper runways is less expensive and will make for better work, and will save also in the cost of wall and column forms than when chuting is used.

X Q. 67. I suppose you have in mind in this connection the various chuting arrangements about which you have testified, and which you say you have used on your various jobs?

A. I have in mind chuting arrangements with wood or steel towers, with derrick-supporting counterweight bridges or girdles, from which chutings are suspended; and I have in mind chuting arrangements by means of heavy cables from which the chutes are hung by manila ropes, so that they can be raised or lowered at will.

X Q. 68. In your criticism you stated that a heavier tower construction would be required for use in connection with delivery chutes than would be required if the concrete is to be distributed by carts. Is that correct?

A. Yes, sir.

X Q. 69. Now suppose you had in one instance an apparatus such as you say you used on the Masonic Temple, where the boom is long enough to permit the dumping of the suspended bucket at a point in the floor area at the most remote side of the building; and another apparatus where the boom or derrick is not so long, but was merely long enough and heavy enough to support a first chute section, which would have a length, say, no greater than half the width of the building; which construction in your opinion would require the heavier tower construction?

A. There is no question that the tower at the Masonic Temple was very much heavier than a tower needed for chuting only, but, first of all, we learned a lesson there not to use such a tower again, and, second, that these booms set all the heavy stone work all around [fol. 43] the building, and thereby saved a great deal in the construction of the entire building.

X Q. 70. Before you place the out-board hopper structures in the Masonic Temple, the concrete at the point of setting of the hoppers had to be hard, didn't it?

A. No, sometimes we placed the corners first, and then we placed the concrete on the part nearer to the tower.

X Q. 71. When you poured the corner portions of the floor first, these hopper structures rested on the forms provided for the reception of the concrete which was ultimately to form the floor, didn't they?

A. Yes, sir.

X Q. 72. And if you poured the corner portions of the floor last, then you had to wait for the middle portion of the floor to set before you could place the hopper structure, didn't you?

A. No, sir.

X Q. 73. What did you do?

A. I can't recollect how we did it on that particular building, but I can tell you how we did it on other buildings.

X Q. 74. You don't recall, then, that in the Masonic Temple operations you ever delayed pouring the corners of the floor areas until after the central portion had been poured?

A. I am quite certain that these hoppers did not cause a delay of from more than four to ten minutes at any time. I do not remember just what order was observed in pouring various portions of the floor; we often had both booms in operation at the same time, one pouring corners and the other pouring center portions, and if we found it necessary to pour a center portion before pouring an adjacent corner, all we had to do was to lay some planks on the freshly poured concrete at the point where we desired to set the hopper structure, [fol. 44] and then to set the hopper structure on these points and go ahead.

X Q. 75. In using these hopper structures, as part of an apparatus

like that shown in your Masonic Temple structures, I presume you found it necessary to set special braces under your forms, didn't you?

A. I cannot recollect as to that particular building, but it is a standard rule which I impress on my men, that when they put up a hopper they should brace underneath.

X Q. 76. What is your nationality, Mr. Mensch?

Objected to as immaterial.

A. I am Austrian.

X Q. 77. You said something about the need of a heavier hoisting engine if the concrete was to be chuted, instead of being distributed by carts. I wish you would explain what you mean by that.

A. That is very simple. It is a common occurrence to see that the tower of a chuting arrangement is made about 100 feet higher than the tower of an arrangement which used carts, and very often the tower is made 150 feet higher. Now, assuming that the structure is only 60 feet high, and that you use, say, a mixer of three-quarter yard capacity of wet concrete, 16 h. p. hoisting engine is of ample capacity to hoist the concrete at the rate of a batch a minute, while if you use a tower made 150 feet higher, you have not only to do twice or three times the actual work of hoisting, but you have to do it in a much shorter time, and, therefore, you need a hoisting engine of at least 50 to 75 h. p. to do the same amount of concrete work.

Cross-examination closed.
Signature waived.

Adjourned till Monday, December 27, 1920, at 10 a. m.

[fol. 45] Chicago, December 27, 1920.

Parties met pursuant to adjournment. Present as before.

WILLIAM R. SINKS, a witness produced, sworn, and examined on behalf of defendants, deposes and testifies as follows in answer to interrogatories by Mr. Jones:

Q. 1. Please state your name, age, residence and occupation.

A. William R. Sinks; fifty-eight years; 25 Crescent Place, Wilmette, Illinois. I am manager for the James Stewart & Company, grain elevator department.

Q. 2. Outline briefly the character of the work done by James Stewart & Company.

A. The company does all classes of general construction work—office buildings, factory buildings, manufacturing plants, railroads, reservoirs, locks and dams, in fact, covering all lines of general construction. We have built the Westinghouse Electric Company's manufacturing plant at Pittsburgh, also their plant in England, known as the "Manchester plant," the greater part of the Allis Chalmers Manufacturing Company's plant at Milwaukee, the Singer

Sewing Machine Company's plants at South Bend, Ind., and St. *John, New Brunswick, the U. S. Placima locks at Placima, La.*, and many other prominent jobs too numerous to mention, some of which are listed in our catalogue, and the value of which approximates about $190,000,000. This catalogue was published about ten years ago, and since that time we have done an equal amount of business. We have built buildings in every principal city in the United States, and in every principal city in Canada, too, also in England.

Q. 3. Explain a little more fully the character of the construction work of which you personally had charge.

[fol. 46] A. I had charge of what is known as the grain elevator department. This department takes care of all the grain elevator work done by the company all over the United States and Canada. The work is of a special nature, and is practically all done by a few contractors who make a specialty of this class of business. They not only do the work, but make the design as well.

Q. 4. How long have you held your present position?

A. About fifteen years with the Stewart Company, that is, since about 1905. Prior to that I was with the Barnett & Record Company of Minneapolis, who were also specialists in grain elevators and design. I was with them twenty years.

Q. 5. Prior to 1905, what apparatus was used for distributing grain or conveying it from the elevator to boats?

A. Numerous devices were used, some of which are illustrated in a publication by George M. Moulton & Company, under date of May, 1902. On page 21 is shown a cross-section drawing of an elevator, and on either sides are spouts, which are typical of what was used at that time and prior to that time. Grain was brought into buildings of this character by railroad box cars. The grain was taken out of the cars and deposited in a pit, from which it was drawn into what is called an "elevator leg." This is an endless belt, with cups about 14 inches apart, the leg extending from the bottom of the pit through the top of the elevator. By rotating this belt the grain is carried up to the top of the elevator by the cup, and discharged into what is called a garner. From this receptacle or hopper, made of wood, steel, or concrete, the grain is drawn into a scale hopper, where it is weighed; and from the grain hopper the grain is drawn through a series of spouting to bins or conveyors. Some of the bins are known [fol. 47] as storage bins, while others are known as boat shipping bins. From the boat shipping bins the grain is drawn through a movable spout, which reaches into the boat or ship; and from the storage bin the grain is drawn into hoppers connecting with legs.

Q. 6. What do you mean by "drawn into?"

A. It flows by gravity.

Q. 7. Are you personally familiar with structures such as illustrated in this Moulton & Company's catalogue?

A. Yes, sir.

Q. 8. Have you ever designed such a structure?

A. Yes, sir. While I was with the Barnett & Record Company I acted in the capacity of general superintendent for all of their work,

and since becoming connected with the Stewart Company I have been the manager of the construction work as well as the manager in the preparation of the plans of practically all of the elevators which they built.

Q. 9. Describe more fully the series of spouting to which you have referred.

A. Directly under the scale is a movable spout. This spout moves in an entire circle and connects with conveyors, and also into other movable spouts, called universal or Mayo spouts. These universal spouts have an elbow joint about the center. The upper end of the top section is hung to the floor; the end of the elbow section is supported from a circular track by a trolley wheel; the lower end of the lower section is supported by a series of casters; and the whole is so arranged that it will reach any point within the extreme radius of the two sections.

Q. 10. Of what are these spouts made?

A. Sheet steel. I have seen them made out of wood, but very rarely.

[fol. 48] Q. 11. Describe the movable spout between the shipping bins and the boat.

A. This boat-shipping spout is made of steel in two sections, the lower section telescoping the upper section and supported from a boom, the boom being supported on the side of the elevator and made to swing back against the side of the elevator when the spout is at rest.

Q. 12. How is the spout supported from the boom?

A. By wire cable, usually fastened to the lower section; but in some instances this cable is fastened to the upper section, and the lower section is allowed to telescope the upper section by means of a slot in the lower section, thus to pass the fastening of the cable for the upper section. This particular kind of a spout is known in the trade as the "Ballinger patent spout."

Q. 13. Is the spout movable, aside from its tesescopic action?

A. The spout is movable both up and down and sideways to the extent of a half circle. By "movable up and down" I mean with the upper end fixed to the building the outer end could move up and down to practically the extent of a half circle; it could also move in a horizontal plane to a half circle.

Q. 14. Explain more fully the purpose of having the boom and the spout movable.

A. The spout is made movable to adjust it for placing in the ship and in various positions in the ship; in order to deliver grain in the ship to any point within the range of the spout.

Q. 15. Refer to page 49 of the Moulton & Company's catalogue and explain briefly the equipment shown therein.

A. The illustration on page 49 shows the Erie elevator at Buffalo, N. Y. The plant consists of what is called a marine house and the [fol. 49] main elevator. The marine house is equipped with what is known as canal boat loading spouts. These canal boat loading spouts operate in the same manner as the one just described. The picture

also shows a spout leading from the marine house to the elevator. This spout is for conveying the grain from the marine house to the elevator. It is supported in the center by a trestle and is trussed in between the supports. I have seen this particular elevator in operation.

Q. 16. What is the frame just to the right of the boat?

A. It is a trestle and mast to support the canal boat spout.

Q. 17. Explain more fully the purpose of the canal boat spout.

A. This is for loading the grain into the canal boat, which take about eight thousand bushels each. The grain thus being loaded into the canal boat would come out through the conveyor gallery, as shown, re-elevated in the marine house, and spouted into the canal boat through the spout shown, and described above.

Q. 18. What delivers the grain into the canal boat spout?

A. The upper end of it connects with the spout, and the spout connects with the leg in the marine house. The lower section of the canal boat spout is not shown in the picture, but when the lower section is connected in place it operates the same as the boat-loading spout above described, and is hung from the mast shown in the picture.

Q. 19. What part of the spout or spout sections referred to is supported by the trestle?

A. The lower end of the main spout and the upper end of the lower section.

Q. 20. You have stated that this apparatus operates the same as the boat-loading spout previously described. Do you mean by this [fol. 50] that the lower section can swing from side to side, and also up and down?

A. The lower section can swing from side to side and up and down, but does not usually telescope, the length of it not necessitating telescoping.

Q. 21. From your previous answer, stating that these two types of spouting apparatus operate in the same manner, do you mean to imply that the trestle and mast, on page 49, are mechanically the substantial equivalent of the swinging boom of page 21?

By Mr. Hood: Objected to as leading.

A. The trestle and mast serve as a support, the same as the side of the elevator in the first instance.

Q. 22. What additional support, if any, is provided for the lower section of the spout, aside from the trestle?

A. There is the mast, to which a tackle is fastened at the top, and from there to the lower section of the spout. This is for adjusting the height and holding it in place.

Q. 23. Do I understand from your prior answers that it also permits this lower length of spout to be swung from side to side to change the point of delivery?

A. When suspended as described, it allows a free movement of the spout from side to side.

Q. 24. I call your attention to two blue-prints, and will ask if you are familiar with the apparatus illustrated therein?

A. I am familiar with the blue-print marked "Sheet 89," made by the Barnett & Record Company, as I had charge of the erection of this particular spout.

Q. 25. Does the date on the blue-print correspond approximately to the period of actual erection?

A. To the best of my knowledge, 1902 is the date when this spout was erected. The date on the blue-print is February 7, 1902.

[fol. 51] Q. 26. Do I understand that this work was done while you were employed by the Barnett & Record Company?

A. Yes, sir, it was. The spout was designed and used for conveying grain from an elevator known as "No. 2 St. Anthony Elevator" to "St. Anthony Elevator No. 3." The spout was made of No. 16 galvanized steel in sections about 15 ft. long and suspended from a cable.

Q. 27. About how high in the air was this spout?

A. The upper end is approximately 120 ft. above the ground; the lower end of the inclined portion is shown as 20 ft. above the ground.

Q. 28. Was it successful in use? If so, about how long was it used?

A. It was successful, and to the best of my knowledge the same kind of a spout is being used at the present time.

Q. 29. What can you say regarding the second blue-print?

A. The second blue-print, Sheet 58, was also made by Barnett & Record for the Minnesota Linseed Oil Company. I am familiar with this installation, but had nothing to do with the erection of it. The spout in general is the same in character, design and construction as the previous one, and is used for the same purpose, except that in this case they ran flax seed through it instead of wheat.

Q. 30. By the last part of your answer, am I correct in understanding that in your view as an engineer or designer it makes very little difference what material is conveyed through such spouts once the apparatus itself is available?

By Mr. Hood: Objected to as leading.

A. It makes no difference in my opinion. The spout is used really [fol. 52] to convey whatever material you want to move.

Q. 31. Is this conclusion true or not with reference to the marine spouts hung from a boom, which you have previously described?

By Mr. Hood: Objected to as leading.

A. The same is true.

Q. 32. Do these two blue-prints represent the only instances of the use of spouts of this character with which you were familiar prior to the time you left the Barnett & Record Company in 1905?

A. Oh, no, there were a great number of similar contrivances used about the mills at Minneapolis [illegible]me were used for spouting sacks of feed or flour, and mill products.

Q. 33. Whose initials appear in long hand on these prints?
A. R. H. Folwell.
Q. 34. Are you familiar with the handwriting?
A. Very. He was chief engineer for the Barnett & Record Company. He was also my chief engineer after coming to Chicago with the James Stewart Company for ten years.
Q. 35. What can you say as to his reputation as an engineer in connection with grain elevator construction?
A. He is one of the leading engineers in this particular construction.

The notary is asked to fasten the blue-prints together and mark them "Defendants' Exhibit 11, Barnett & Record Blue-Prints."

Q. 36. I call your attention to a book of the Webster Mfg. Co., containing their catalogue M, dated 1901, and having the name "R. H. Folwell" on the cover, and will ask if the illustration on page [fol. 53] 235 corresponds generally to any of the apparatus you have been referring to.

By Mr. Hood: Counsel for defendant is asked whether he relies on any portions of the publication referred to, other than page 235.
By Mr. Jones: We rely upon various portions of the book to illustrate the state of the art, more particularly pages 42, 168, 170, 192, 193, 197, 201, 236, and 240.

A. The illustrations on pages 235 and 236 are the same as those described as the Ballinger spout.
Q. 37. Are you familiar with the apparatus illustrated on pages referred to in the previous paragraph?
A. I am familiar with all of these.
Q. 38. At how early a period would you say that these devices were used, making a conservative estimate?
A. As early as 1904.

By Mr. Jones: The notary is requested to mark this book for identification "Defendants' Exhibit 12, Webster Mfg. Co.'s Catalogue."

It is stipulated that if a competent witness were called he would testify that the catalogues in this book were published in 1901.

Q. 39. In your experience prior to 1905, have you used concrete in your construction work?
A. Yes, we used concrete. It was used in the foundations of elevators very extensively prior to that date. Barnett & Record only built one concrete elevator prior to that date.
Q. 40. What were the specifications, generally speaking, with reference to the amount of water used in mixing concrete prior to that date?
A. Architects in general prior to the year 1904-05 demanded that concrete be mixed what is known as very dry, and to such a con- [fol. 54] sistency that it required considerable tamping to make the

water flow on top; but grain elevator designers and contractors have never been governed by architects' rules and guidance or specifications, as the elevator designer generally built the elevator that he designed, or that some other Company designed; therefore they were a sort of law to themselves, and, in my opinion, were the first designing engineers and contractors to use what is known in the trade as "wet" or "sloppy" concrete. In my opinion this was brought about by the use of what is called "slip" of "movable" forms. By the use of such form, which is usually about 4 ft. high, the wall, column, or girders, is formed by filling the movable form with sloppy concrete and reinforcing, and at the same time constantly raising the form by a series of jack screws supported on steel bars, which are embedded in the concrete. The jack screws are fastened onto these bars, and by turning down the jack screw the form is forced up; thus making the structure one monolithic mass; but to do this the concrete had to be run into the form in a liquid state, and such a liquid state that it did not require tamping, but only spading.

Q. 41. During the first year or two that you were with the James Stewart Company, were any concrete grain elevators built under your supervision?

A. Yes, sir.

Q. 42. Prior to 1907, for example, what apparatus did you use for distributing the concrete in building grain elevators?

A. From the mixer the concrete was spouted into a hoist hopper. This hoist hopper was hoisted by power to the top of the building as it was in course of construction. When reaching the top a gate, which was provided on the side of this first hopper, was opened and [fol. 55] the concrete material allowed to discharge through a spout into another similar hopper, but stationary. This last-named hopper was usually located about from 15 to 20 ft. away from the side of the hoist tower, and in the elevator work was supported on the movable form. From this hopper the concrete was drawn into wheelbarrows or concrete carts, and with these distributed into the various walls, columns and floors.

Q. 43. Are you familiar with concrete-distributing apparatus used at the present time, consisting of a tower, hoist, hopper at some high point on the tower, and a chute or series of chutes extending from the tower and supported sometimes from inclined cables and sometimes from a boom?

A. I am.

Q. 44. To what extent have you used such apparatus up to the present time in building grain elevators?

A. I have never used it but on one job.

Q. 45. What other concrete structures have you built besides grain elevators during your past experience?

A. I have built warehouses, dry docks, office buildings, and factory buildings.

Q. 46. To what extent have you used this modern chuting apparatus in building these structures just mentioned?

A. I never used the spouting system in question on any construction, except one elevator.

Q. 47. Why have you not used it more?

A. In my opinion it was too expensive in first cost of spouting, towers, hoisting, &c., besides it is more or less hazardous, and it is not adaptable to elevator construction above the foundation.

Q. 48. Why not?

A. The principal reason is that the walls of the elevators are thin, ranging from 6 to 8 inches, and it is impossible to spout concrete [fol. 56] into these walls without getting too much in various places, and the frequent changing of the spout necessitates much more labor than is required to deposit the concrete as and where wanted by concrete carts.

Q. 49. Have you given any consideration to the comparative cost of building structures, using these high towers and chutes, as compared with carts and similar appliances?

A. I have made calculations of the cost of various spouting plants that I have come in contact with, and taking into account the amount of concrete to be poured, in my opinion the cost of the spouting equipment, including the tower and the extra hoisting, made necessary by the high tower, is greater than the total cost of the labor necessary to deliver the same amount of concrete in the forms by hand and by the use of carts and wheelbarrows. This condition is not universally so, but it is so in a great many cases.

Q. 50. You have referred to the forms as necessitating wetter concrete; are there any other developments which have promoted the use of more water in the mixture?

A. In the use of reinforcing, and particularly where the reinforcing is very close together, it is absolutely necessary to have the concrete in liquid form, so as to thoroughly embed and encase the reinforcing.

Q. 51. What do you refer to by "reinforcing"?

A. By "reinforcing" I mean the embedded steel bars.

Q. 52. What is the practice of architects today with reference to the use of wet concrete?

A. I don't think I am competent to say just what they are, only from general knowledge—we don't work under architects. My general knowledge is that they still want the concrete reasonably dry.

[fol. 57] Q. 53. Is more wet concrete used today than when you came to Chicago in 1905?

A. Very much more.

Q. 54. Are you familiar with the use of booms in buildings other than the grain elevators you have referred to?

A. Yes, we use booms on all our derricks.

Q. 55. Describe the use of booms in erecting the steel framework of modern steel buildings.

A. Sometimes we put a boom on the columns of the building; this for hoisting materials into the various stories. In erecting the steel framework we use the regular stiff leg derrick, consisting of a mast, boom, sills, stiff legs. The stiff legs are used to support the top end of the mast and hold it in vertical position. This style of derrick is usually used to erect steel work on buildings, and it is

generally customary to use more than one, and so locate them that one can pick up the other and put it on the next story above as the building is raised.

Q. 56. In other words, as the building get- higher, there is always a boom at or near the highest story of the steel framework, is that correct?

A. No, that isn't quite correct. The derricks would be so located that you could set another derrick on the highest steel work.

Q. 57. Have you ever seen booms used having their lower ends vertically adjustable to raise the boom higher?

By Mr. Hood: Objected to as leading.

A. We sometimes used a boom in connection with the columns of the building, using the column as a mast, and as occasion demanded raised the boom up from story to story. Such arrangement is not used for putting material on the top of the building; it is used for landing material on the various floors as the building goes up.

Adjourned until 2 p. m.

[fol. 58] December, 28, 10 a. m.

Met pursuant to agreement; present as before.

Q. 58. About how early have you seen vertically adjustable booms used, such as described in your last answer?

A. I should say about twenty-five years.

Q. 59. You saw the elevator shown on page 49 of George M. Moulton & Company's catalogue, as you have previously testified. When did you see this installation, and particularly the spouts and their support used in loading canal boats?

A. As early as 1904.

Q. 60. How do you fix the date?

A. I was building the Marine elevator, just a few blocks away from this one, and was well acquainted with the superintendent that ran this elevator, and visited with him. I fix it by the date of my marriage in that year.

Q. 61. Will you give a partial list of grain elevators which have been built under your supervision?

A. In the United States the following elevators are some that I have had supervision of: American Malting Company, Buffalo; Marine Elevator, Buffalo; Perot Elevator, Buffalo; Girard Point, Philadelphia; Baltimore & Ohio, Baltimore; Northern Central Elevator, Baltimore; Milwaukee Elevator, Kansas City; Sunset Elevator, Galveston; Washburn & Crosby Elevator, Buffalo; Washburn & Crosby Elevator, Minneapolis; Cargill Elevator, Minneapolis; Standard Milling Company, Duluth; Peavy Elevator, Duluth; Canadian Pacific, Fort William, Canada; and possibly a dozen more in Canada, and a great many more in the United States.

Q. 62. Have you seen any other canal boat loading spout devices, of the kind shown on page 49 of the previously mentioned catalogue?

[fol. 59] A. Practically all elevators in Buffalo had the same or similar devices for loading canal boats at that period.

Q. 63. About when did you first learn of the existence of the patent in suit?

A. I don't remember just the date, but some two or three years ago I heard there was such a patent.

Q. 64. When did you learn that it was involved in litigation?

A. Only recently. I was very much surprised to learn there was any litigation on this proposition?

Q. 65. Why were you surprised?

By Mr. Hood: Question objected to as wholly immaterial.

A. Because it seemed to me that spouting of all kinds of material that could be spouted had been in use for years.

Q. 67. Do you know what company or companies sell chutes and related appliances for spouting concrete?

A. The Insley and Lakewood Companies.

Q. 68. Do you know anything about the prices charged by either of these companies for this apparatus?

By Mr. Hood: Objected to as immaterial.

A. They have quoted us on this class of equipment several times, and we considered the prices very high. I might add that our opinion is based on our experience of what we can purchase steel spouting for, for grain elevator work.

Q. 69. I call your attention to some of the patents set up in the answer in this suit, and will ask you to glance at the drawings, and state whether you have seen apparatus of the type illustrated therein in use; and if so, about what time?

A. Edwards 366,468 of 1887. I have seen and actually have built a similar plant. The drawing represents a small suction dredge. [fol. 60] The suction pipe is raised and lowered by a tackle supported by a boom and mast. There is also shown a high pressure pipe line, following the suction line, and discharging at the end of the suction line, to be used for loosening the material to be sucked up by the dredge. There are also side lines to the boom or suction pipe, these being for moving the suction line in a circular direction.

Q. 70. Can the pressure pipe and the suction pipe be moved in any other direction besides a movement of the outer end from side to side?

By Mr. Hood: Objected to as leading.

A. The end of the suction pipe can be moved both vertically and horizontally. They both move together and are fastened together.

Q. 71. Is the boom fixed or movable?

A. The boom in the cut here shown is movable. The boom follows the suction pipe horizontally.

Q. 72. About when did you see and build the similar plant you referred to?

By Mr. Hood: Question objected to as relating to matter not set up in the answer.

A. About twenty years ago.

Q. 73. Can you produce a photograph or cut of it?

A. Yes. The identical cut is shown on page 49 of a book entitled, "Plans of Grain Elevators," published by the Grain Dealers under date of January, 1918.

By Mr. Hood: It is understood that the objection entered to Q. 72 shall apply to this subject-matter without repetition.

In view of the difficulty of completing the very extensive investigation considered necessary by defendants, it is stipulated that no objection will be made on the ground that evidence is adduced by [fol. 61] deposition prior to amendment to the answer in order to plead the particular matter in the deposition. This stipulation is made in order to avoid delay in the taking of the testimony.

The book referred to by the witness is marked for identification, "Defendants' Exhibit 15, Plans of Grain Elevators."

By Mr. Hood: It is agreed that objection to this exhibit, as irrelevant and immaterial, may be considered as entered, whenever the same is offered in evidence.

Q. 74. Can you produce some other photograph of your dredge?

A. I think I have in our files at the office some other photographs, but have been unable to find them.

Q. 75. Describe briefly the construction and operation of your dredge.

A. The dredge in question is practically the same as that shown in the patent, and operated in the same manner.

Q. 76. As I understand it, then, it comprised a floating structure having two pipes, a pressure and a suction pipe, arranged to move together, swinging about their inner ends as a pivot, so that the outer ends could move in arcs of circles, either horizontally, vertically, or in any other direction, these outer ends being supported from a pivoted boom, the latter being capable of swinging from side to side. Is that correct?

By Mr. Hood: Objected to as leading.

A. That is correct.

Q. 77. In your dredge, did the boom move in any other direction than that referred to in the previous question?

A. It did not.

Q. 78. That is, it was held at a substantially fixed angle in a [fol. 62] vertical plant, but could swing from side to side; is that correct?

A. That is correct; there is no occasion to have the boom move up from its horizontal position. It is simply used for raising the suction pipe and the pressure pipe up above the water level, which the dredge was floating in.

Q. 79. When you referred to horizontal position, you pointed to

the boom G of the patent; did you intend to imply an inclined position nearly horizontal or exactly horizontal?

A. In the dredges I built the boom was horizontal.

Q. 80. How long was your dredge used?

A. It was used, to the best of my knowledge, about seven or eight years.

Q. 81. Have you seen any other dredges, prior to 1907, in which a pipe was suspended from a boom in such manner that the pipe was in inclined position, but could be adjusted vertically to vary the angle in a vertical plane, and could also be swung from side to side by the boom to change the location of its outer end?

A. Yes, I have seen larger hydraulic suction dredges equipped with what would be the equivalent to a boom. The mast and boom are used as one, by inclining the mast, and guying it back to the back end of the boat. With these large dredges the suction pipe is moved around in a circular swing by cables fastened to either side of the suction pipe and then anchored to the shore or to a buoy at either side. The pulley line is brought back to a power winch on the dredge.

Q. 82. What becomes of the mud and water which is sucked up by dredges, such as those you have just described, including your dredge and the one shown in the Edwards patent?

A. In the dredge I built, the material after passing through the [fol. 63] suction pump was discharged into a series of wooden troughs, which were supported by piles or other means and laid on an incline, which gave sufficient fall for the water, so that the water would carry the sediment. The position of the pipes was changed so as to discharge the material where desired.

Q. 83. In cases like this, how is the last section of pipe or trough supported? I refer to the discharge end of the line.

A. It would be supported the same as the other, up above the fill line.

Q. 84. Do you recall any instances where the last section of pipe or trough was supported in any manner, except on piles?

A. The first section from the dredge was sometimes supported by a boom—this to span over a space of deep water, where pile supports could not be secured.

Q. 85. How is the last section or discharge pipe or trough moved so as to discharge the material where desired, as you have stated?

A. It is moved by hand.

Q. 86. Where the first section is supported by a boom to span deep water, is this section always at a fixed angle to the dredge?

A. Yes, it was a fixed angle to the dredge, but not always in the same angle to the discharge trough.

Q. 87. Suppose the material was flowing away from the dredge at a certain angle, and you wished to turn the dredge part way around; do I understand that the section supported by a boom being at a fixed angle would prevent such turning?

A. To a great extent it would, but it has its limits. The wood spouts would have to be adjusted to some extent to fit the new angle.

Q. 88. However, you could turn the dredge through a small angle?

[fol. 64] A. Yes, what you would call a small angle.

Q. 89. The next patent I hand you is McLennan, No. 371,343, of 1887.

A. I have seen apparatus of this kind, prior to the time I came to Chicago in 1905. In fact, that represents one of the oldest elevators I ever saw. McLennan was one of the pioneers.

Q. 90. Please identify, if you can, the structures of the remaining patents which I hand you.

A. Simpson 445,645 of 1891; I have seen apparatus of this kind in use, prior to 1905.

Robinson 524,984 of 1894: I have also seen apparatus of this type in use prior to 1905. The illustration shows and describes a distributing spout beneath the grain hopper and connected to the grain hopper. The spout is supported on a central standard, and is in two sections. The upper section will move an entire circle around the standard, and the lower section will move in an entire circle around the point where it connects with the upper circle, thus reaching all points within the greatest radius of the two sections. The illustration also shows a brace 18, designed to support the central portion of the spout.

Walsh 560,382 of 1896: I have not seen the apparatus in combination as illustrated in this patent, although I have seen derricks with gib booms used for various purposes, and have also seen spouts used for spouting coal or other like material into the boat.

Bird 582,598 of 1897: I have seen this identical device in use. To all intents and purposes it is the same as Robinson patent 524,984.

Bellinger 605,375 of 1898: I have previously described this patent, and I have seen the spout in use at Duluth.

Robinson 622,019 of 1899: This is the same as the other Robinson patent, except that it does not have an equal amount of flexibility. The lower section will not turn a complete circle, as it inter-

[fol. 65] feres with the vertical standard. I have never seen equipment of that kind.

Clarke 718,092 of 1903: I have never seen any equipment of this kind. This spout is nothing more than a double telescope spout. In other words, there are two telescopes on the main spout instead of one, but otherwise similar to the Bellinger spout.

Q. 91. Were the coal spouts that you referred to in connection with the Walsh patent fixed at a permanent angle or capable of movement?

A. They were subject to movement on the outer end, the other end being fixed.

Q. 92. In how many directions could they move?

A. Up and down.

Q. 93. Who is the patentee Robinson to whom you have referred?

A. Robinson used to be an elevator builder. He now lives in Seattle.

Q. 94. Are you familiar with the Mayo spout?

A. Very familiar with it. I was with the Barnett-Record Company when the design of the Mayo spout was made, and had more or less to do with its design; but the patent was put in his name, as he was the chief engineer at the time—it must have been about 1903, or earlier. The Mayo spout is similar in action to the Robinson spout, patent No. 524,984, except the top section of the Mayo spot is supported by a circular track, and on the track a trolley fastened to the upper section of the spout, thus allowing the lower end of the spout free space and movement to reach all points within the greatest radius of the two sections.

Q. 95. About when did you see in use swivel grain spouts supported by braces 18 and 15, shown in the respective patents to Robinson 524,984, and Bird 582,598?

A. As I remember it, it was a year or two after the Mayo spout [fol. 66] was invented and placed in use—about 1904, I think. There was some litigation about these spouts.

Q. 96. In any case, are you sure that you saw apparatus substantially like these patents as early as 1905?

A. Yes, I did.

Q. 97. In apparatus such as the Robinson, Bird and Mayo, where does the grain come from before it reaches the hopper immediately above the swivel pipes?

A. Sometimes the grain comes out of the garner above, and sometimes these spouts have been used on the first floor for drawing grain out of storage bins. In both cases the grain is previously elevated to the top of the elevator, and in reaching its destination in the storage and shipping bins it passes through one or more spouts.

Q. 98. So that elevators thus equipped comprise a supporting structure projecting upwardly to a considerable height, and having in it means for raising the material to a suitable point in the height of the structure, means in the form of bins or receptacles for receiving the material and conducting it to the swivel pipes, the upper section of swivel pipe being supported or carried, at least in part, by a diagonal arm or brace, or else by a trolley, the diagonal arm in the case of the Robinson and Bird structures being suitably supported so as to oscillate or move in a plane which is nearly horizontal; is that correct?

By Mr. Hood: Objected to as leading.

A. That is correct.

Q. 99. And such apparatus has been in extensive use to your personal knowledge at least as early as 1905?

A. It was in use as early as 1905.

Q. 100. And in most elevators where the grain is loaded into boats, there are provided pipes extending downwardly from the side of the elevator and supported by horizontally moveable booms for directing [fol. 67] the outlet of the pipe to any convenient part of the boat within range of the apparatus?

By Mr. Hood: Objected to as leading.

A. Practically all elevators delivering grain to ships are thus equipped, and have been prior to 1905.

Q. 101. Do the ships move any while they are being thus loaded?

A. The ships do move up and down with the rise and fall of the water or tide.

Q. 102. Have you any specific instance in mind?

A. The greatest movement of any ships I know of is at St. Johns, N. B., where they have an extreme tide of 35 feet.

Q. 103. Aside from the tide, do such ships move any while being loaded?

A. Not while the grain is running, they don't intend to move the ship.

Q. 104. Is the settling of the ship appreciable in such cases?

A. When loading ships in the lake, the ships settle in the water as loaded—about a maximum of 12 or 14 feet.

Q. 105. During such settling and in the case of tides, are the discharge spouts adjusted any?

A. In case of the extreme tide, as mentioned, there is a vertical spout with a hopper at the top used for the inclined spout to discharge into; the inclined spout would be held in position by the boom and tackle on the elevator, while the vertical spout would be held by the ship's tackle and boom; and the vertical spout adjusted to take care of the movement by the tide and the settling of the vessel as it is loaded. In the lakes the spout is lowered to take care of the settling of the boat as it is being loaded.

Q. 106. Referring to "Defendants' Exhibit 15," the book of the [fol. 68] Grain Dealers Journal, I will ask you to explain how the marine leg or conveyor, shown on page XI, is swung outwardly?

A. The leg is pushed out with a device called a "leg pusher" operated by power. It is represented in the cut as an inclined member, with one end resting against the back end of the leg and the other supported in the building.

Q. 107. Please refer to page XVII, and state if you are the W. R. Sinks referred to therein as a joint inventor with R. H. Folwell of "an ingenious device" for raising forms, used in the erection of the Girard Point elevator.

A. I am the W. R. Sinks mentioned, and R. H. Folwell is the same Folwell previously mentioned in this deposition.

Q. 108. Please refer to the illustration in the upper right-hand portion of page XXI, and state about how long the loading apparatus shown therein, particularly the boom and spout arrangement, have been used.

A. Referring to the divided cable on the end of the spout, I don't remember where I first saw the device.

Q. 109. Under what conditions are the booms used, such as are shown at the bottom of page XXII and the top of page XXIII?

A. Ordinarily this type of boom support is used where there is not sufficient height above the boom to use a suspension member. The picture at the top of page XXII shows an installation of the Mayo type of spout.

Q. 110. State whether the concrete-distributing apparatus shown on page XXIV is typical of your practice before and after coming to Chicago, or whether it represents some special practice.

A. The arrangement of the boom as shown on the tower here is, in general, the same as used on buildings previously and since com- [fol. 69] ing to Chicago. The boom here shown is fastened onto the corner post of the tower, and is used in this instance for hoisting steel and such lumber as might be needed, and possibly like materials.

Q. 111. Does the boom remain at a fixed height throughout the work?

A. No, the boom is raised up from time to time to suit the height of the structure.

Q. 112. And was this your practice with similar towers and booms prior to 1905?

A. Yes, sir.

Q. 113. Did you increase the height of the tower as the work progressed?

A. It was my practice to raise the towers at three different times. This was done to avoid the hazard of having such a high tower standing with only guy supports.

Q. 114. Is this tower and boom, as illustrated in the book referred to and as used by you prior to 1905, of such a character that you could have hung a concrete chute from the boom, so that it would extend downwardly from some point on the tower if you had considered it desirable to discharge the concrete in this manner?

A. As a general thing, towers, such as illustrated and referred to, could not be used for attaching concrete spouts, as they were not built strong enough.

Q. 115. As I understand it, then, had you desired to use concrete spouts with your apparatus, it would have been necessary merely to have made the tower somewhat stronger; is that correct?

A. The tower would have had to have been made stronger, the amount of strength necessary depending on the length of the concrete chute which might be attached to it, also the length of the boom which might be used. Both would materially affect the design and strength of the tower.

[fol. 70] Q. 116. And any competent engineer could readily determine what additional strength would be necessary in such a case, could he not?

A. A competent engineer could determine the necessary strength to provide for.

Q. 117. Prior to 1905, had you ever seen towers of this general type carrying booms, the structure being designed sufficiently strongly to permit the booms to lift and place heavy stones and other heavy objects?

A. Yes, I have seen towers of that character.

Q. 118. I intended to have you answer Q. 110 with more particular reference to the concrete-distributing apparatus; will you kindly amplify your answer?

A. I did not build this particular tower or structure, but have built similar towers and structures prior to 1905. It is our general practice

to place the mixer or mixers at the bottom of the tower and allow them to discharge into a hopper hoist. This is hoisted to the top of the structure, and there discharged into a spout by means of a slide; and the spout discharges into another hopper, from which hopper the concrete is drawn into carts and distributed into the structure. The last hopper in some instances would be close to the tower, while in other instances it would set 20 or 25 feet away from the tower, and was supported on the movable form.

Adjourned until 2 p. m.

Met pursuant to adjournment.

Q. 119. Are you familiar with the elevator illustrated on page 14 and the top of page 15 of this Exhibit 15?

A. I am familiar with it, and have been in it. I saw it soon after coming to Chicago in 1905.

Q. 120. How are the spouts on the right-hand side of the elevator held in place, referring to page 14.

A. The car spouts referred to are held in place by horizontal supports on the side of the building.

[fol. 71] Q. 121. What are the curved extensions at the ends of the two spouts?

A. They are what is known in the elevator trade as bifurcated car-loading spouts, and are made of sheet steel and divided at the lower end into two sections, curving upward and outward. The extreme end is also hinged so that the ends will let down and clear the car. The lower end of the spout is also telescoped, so as to adjust the ends of the spouts to fit the varying size of the cars.

Q. 122. What are the spouts seen projecting to the left in the building shown on page 34?

A. The two upper spouts extend to a mill adjoining, and each is suspended from a catenary wire cable. The lower spouts are car-loading spouts.

Q. 123. Is there anything among the exhibits you have previously referred to which illustrates the catenary suspension shown on this sheet?

A. Exhibit 11, Barnett-Record Blue Prints, shows the catenary cable in detail. It is not the same building, but is typical.

Q. 124. What is shown on page 61 of this book?

A. A structural view and a finished view of the Weehawken elevator. On page 60 is a cross-sectional view of the same elevator. Directly above the bins is what is called the distributing floor, which in this plan elevation is shown as a universal or Mayo spout. On the left is the boat-tipping spout, with boom for supporting same.

Q. 126. What is the large spout intended for in the upper picture on page 124?

By Mr. Hood: Attention is called to the previous agreement that objections to the book, "Plans of Grain Elevators" will lie without repetition. Further objection is made to the reference to this par-

ticular portion of page 124, on the ground that on its face it illus-
[fol. 72] trates a structure produced subsequent to the patent in suit.

A. It has every appearance of being a cob spout, for conveying the cobs from the sheller to the boiler house.

Further objection is made, as it appears from the answer of the witness that he is not testifying from personal knowledge of this particular structure.

Q. 127. Did you ever see such cob spouts prior to 1907?
A. Yes, sir.
Q. 128. This is a fair illustration of such earlier apparatus, is it?
A. Yes, sir, a cob spout is nothing but a plain sheet iron spout, with sufficient incline to make the cobs run through by gravity.
Q. 129. You have referred to spouts for the distribution of grain, corn cobs, and coal in your personal experience. What other material have you seen being distributed through inclined pipes or chutes prior to 1907?
A. I have seen crushed stone, sand and iron ore.
Q. 130. You previously referred to coal chutes on docks; have you seen any other type of coal chute?
A. Yes, I have seen coal chutes in connection with coal elevators in stock piles, where the coal was elevated and spouted out through the side of the building into a stock pile, and into bins. The spout would be supported in similar manner to the spouts heretofore referred to as shipping spouts in connection with grain elevators.
Q. 131. Do you mean that the spout could swing in any direction and was suspended from a swinging boom?
A. Yes.
Q. 132. From your knowledge and experience gained in the dredging business, grain-distributing art, and concrete building art, what would you say with reference to the amount of ingenuity that would be required about 1907 or 1908 in supporting a pipe or chute from a
[fol. 73] boom, so that it could swing back and forth through a considerable angle to distribute concrete first at one point and then at a different point, assuming that conditions arose that made such distribution desirable?
A. In my opinion it would take no ingenuity to spout the concrete, as all the principles used in spouting the grain could be used in spouting the concrete, and, in fact, are used to spout the concrete, and have been used since 1907 or 1908.
Q. 133. What was the first large concrete office building which came to your attention as one made entirely of reinforced concrete?
A. The first building of this character that I ever heard about was built about 1902 in Cincinnati, and known as the Ingalls building. I did not view this building during its construction, but did visit it some years after.
Q. 134. To what extent was this building known to the building trade about the time it was built?
A. It was understood in the trade, so far as I know, as being the first concrete office or store building ever built in this country.
Q. 135. Did it cause any particular comment?

A. Yes, it caused a great deal comment, as to whether it would be stable, and would withstand the weather, temperature, etc.

Q. 136. About when did reinforced structures of this character begin to be built quite generally?

A. The building of like concrete structures has increased annually ever since—to just what extent I am not able to say.

Q. 137. From your knowledge of the art, about what percentage of all the concrete structures built in the United States today are built by the use of high towers, from which chutes are supported in some manner, as compared with concrete-distributed in other ways?

[fol. 74] A. I have no way of determining the per cent, but it would be my judgment a very small per cent of the whole number of buildings built used high towers and concrete spouting equipment, of the kind you referred to. In making this estimate I have in mind taking into account all structures which have concrete in their construction.

Q. 138. Have you ever seen apparatus such as shown on page 280, upper half, of Exhibit 15?

A. Yes, sir, I have seen similar equipment, but not this identical one prior to 1905.

Q. 139. Are you familiar with the Gerber spouting illustrated in the advertisements at the back of this book?

A. Yes, I am familiar with it. These types of spouts have been used since 1905.

Q. 140. How does the apparatus in the right-hand cut operate?

A. It has a cable extending to the lower floor of the elevator. By pulling on this cable the end of he spout is raised up out of the funnel in the floor, permitting the spout to be turned around to another funnel.

Q. 141. Have you any records from which you can give the date when the two Ely Walker Dry Goods Companies' buildings were built in St. Louis?

A. Construction views illustrating these buildings are shown in a book called "Some Stewart Structures" on pages 42 to 45, inclusive, and under each of the construction pictures is given the dates on which the photographs were taken. The Mercantile House on Washington Avenue and St. Charles Street, between 15th and 16th Streets, was built between February 15, 1907, and August 1, 1907; the Warehouse building was located on Locust Street, immediately behind the Mercantile building above described, and was built between February 15, 1907, and August 1, 1907.

[fol. 75] By Mr. Hood: Objected to as immaterial, and as relating to a structure not pleaded.

By Mr. Jones: The book is submitted to Mr. Hood for his inspection. The buildings will be referred to later in connection with the date of building the American Theatre building. Mr. Hood will recall that when Herman Bankes testified as a witness for one of the plaintiffs, William H. Insley, about six years ago, he referred to one of the Ely Walker Buildings to help fix the date of invention of the apparatus he claimed to have used subsequently on the American Theatre building. Mr. Bankes may be called as a

witness later, and therefore reference is made to the Ely Walker buildings at this time.

By Mr. Hood: Counsel for defendants is asked to have this book available for inspection by counsel for plaintiff, if such inspection is called for.

Q. 142. Are you familiar with the placing of concrete under water?

A. I have seen it done, but I have never done it myself to any extent.

Q. 143. Please describe how it was done prior to 1907.

A. I recall one instance of seeing a contractor putting in the center pier of a swing bridge between Boston and Charleston. In this instance the vertical spout was suspended above the water line by a boom from a mast located in the center of the pier, and so arranged that the boom would swing the entire circle, and the spout was arranged on wheels, so that it could be run in and out from the boom to the extreme outside of the pier, and as it was so moved and in a circular direction also the concrete was deposited in the pipe, and the pipe maintained full of concrete up above the water line, [fol. 76] and as fast as it settled down to the water line it was filled up again above the water line. In this way the concrete reached the bottom of the pipe in mass, and as the pier was built up the lower end of the spout was raised up by telescope sections in the spout.

Q. 144. Was the concrete wet or dry in the pipe?

A. When placed in the top of the pipe it was quite dry; but when it reached the water level it became submerged, and the water would come in at the bottom and come up.

Q. 145. Have you ever seen the Chicago & Northwestern Railway's terminal elevator at 122nd Street and Calumet River, referred to in the first article in the book Exhibit 15?

A. I have seen the building.

By Mr. Hood: Objected to as immaterial, and as relating to matter not pleaded.

Direct examination closed.

Cross-examination by Mr. Hood:

X Q. 146. You stated that you have just once made use of chutes for chuting concrete in building a grain elevator in conjunction with a tower, hoist, and hopper. How were the chutes supported in that equipment?

A. They were supported from a cable.

X Q. 147. And how was the cable supported?

A. One end was supported from the hoisting tower, and the other end from a smaller tower and the adjoining building.

X Q. 148. When was this apparatus used?

A. It has been used the last two years.

X Q. 149. Do you mean that the first and only time you used this apparatus was about two years ago, that is about 1918?

A. Yes, sir.

[fol. 77] X Q. 150. When did you first begin to erect structures composed in part or in whole of concrete?

A. The first all-concrete grain elevator I erected was in 1903.

X Q. 151. And during each year thereafter you erected a number of concrete structures, did you?

A. Yes, sir.

X Q. 152. And during your experience you have had occasion to make use of wet or sloppy concrete to a considerable extent, have you?

A. In the grain elevator construction we have always used what is known as "sloppy" concrete.

X Q. 153. And such use has resulted in the fabrication of satisfactory buildings?

A. Yes.

X Q. 154. You have compared the cost of chuting design for chuting concrete with chuting design for chuting grain; is the chuting for concrete of a heavier construction than that used for grain?

A. As a general thing, yes.

X Q. 155. Were you subpœnaed as a witness in this case?

A. No, sir.

X Q. 156. At whose request did you appear to testify?

A. At Mr. Jones request.

X Q. 157. Are you to be paid for your time?

A. No, sir, not that I know of.

X Q. 158. You spoke about some litigation relative to the Mayo spout; were you surprised at that litigation also?

A. I was.

Cross-examination closed.

[fol. 78] Redirect examination by Mr. Jones:

R. D. Q. 159. You have referred to the use of chutes for crushed stone, coal, and iron ore; would concrete chutes have to be of any heavier construction than such chutes?

A. The design is largely dependent on the amount of material you want to pass over at a given time. In mixing concrete the volume is fixed a more or less extent by the size of the mixer, which is generally a half yard or a yard, and it mixes a batch in about three-quarters of a minute, so that fixes to a large measure the capacity of a concrete spout. Spouts for other materials are gauged by the amount and volume of material you want to run through at a given time.

R. D. Q. 160. In other words, then, as I understand it, an experienced man would build his chutes of such weight of material and of such size as to properly convey and stand tthe wear and tear of the material he wished to slide through the chute or pipe; is that correct?

A. That is correct. The concrete material will cut out the steel spout very fast, while cobs or flaxseed would wear the spout very little, consequently a lighter material could be used.

R. D. Q. 161. And in building a hoisting tower, and in guying it, an experienced man would build it of light construction or heavy construction, depending on whether it was to be used merely for hoisting, or whether it was to be subjected to lateral stresses, caused by mounting a boom or other equipment on it, and would brace it and guy it according to the class of service to be expected of it; would he not?

By Mr. Hood: The question is objected to as leading and not proper redirect examination.

[fol. 79] By Mr. Jones: The question is based on Mr. Hood's X Q. 154 relating to chuting designs.

A. In building a concrete tower, the first thing to be determined is the ultimate distance or the length of the concrete spout will have to be. With this determined you can estimate the amount of concrete which will be in the spout from one end to the other at a given time, also the weight of the spout itself, and this will determine the dimensions of the tower and of the members of which the tower is made and the guy wires for the tower.

R. D. Q. 162. And having determined these points, what would an experienced man do next?

Last objection repeated.

A. It would be a simple matter to construct the tower and hang up the spouts.

R. D. Q. 163. And these factors could have been estimated and this construction work done as readily in 1905 as at the present time, if the problem were presented to a man experienced in the erection of towers and devices of this character?

A. I don't see that the date has any connection with it whatever.

R. D. Q. 164. Do I understand you to mean that you, or some other man skilled in the art, could have worked out this engineering problem as readily in 1905 as you could at the present time; is that correct?

A. That is correct.

Deposition closed.

[fol. 80] HENRY O. WEBB, a witness produced, sworn, and examined on behalf of defendants, in answer to interrogatories by Mr. Jones, deposes and testifies as follows:

Q. 1. State your name, age, residence and occupation.

A. Henry O. Webb; thirty-eight years; 5414 Potomac Avenue, Chicago, Illinois. I am a cement finisher.

Q. 2. Have you had any experience in the construction of reinforced concrete buildings?

A. Yes, sir.

Q. 3. Are you familiar with the method of distributing the concrete during the erection of the American Theatre & Hotel Building in St. Louis?

A. Yes, sir. We spouted with the iron chutes.

Q. 4. Describe a little more fully the distribution of the concrete, beginning with the mixer.

A. The concrete was mixed in a mixer, dumped into the skip, hoisted to the receiving hopper on the tower, and from there spouted onto the floor with iron chutes suspended from cables with blocks and falls, and also rested on horses.

Q. 5. Which part of the chutes rested on the horses?

A. The last sections of the chutes that deposited the concrete on the floor.

Q. 6. Where was the mixer?

A. I don't recollect whether it was on the first floor or the basement. It was naturally at the bottom of the tower.

Q. 7. What kind of a tower was used?

A. It was a wood tower, built out of timbers, the timbers of the uprights of the four corners having 2 x 8 ribbons and 2 x 8 cross braces fastened to the steel structure where possible, and where not possible to fasten them to the steel structure it was anchored with wire cables.

Q. 8. How did the concrete get from the skip into the receiving hopper?

A. The skip dumps. The skip is fastened with a trip and when [fol. 81] it gets to the right height the trip is dumped by a block fastened on to the slide. A skip is balanced on an axle at the bottom of the skip.

Q. 9. When the concrete was first distributed at the lower part of this building, where was the hopper?

A. Approximately 50 ft. above the floor.

Q. 10. Where was the hopper when the concreting reached the top of the building?

A. The hopper was about 15 or 20 ft. above the level of the roof.

Q. 11. What was the nature of your work during the time that this building was built?

A. I was with the Gilsonite Construction Company. I was foreman of the concrete work being spouted on the American Theatre & Hotel Building.

Q. 12. Who was responsible for the use of these iron chutes, which you say were used for distributing the concrete?

A. The superintendent of the job, Herman Bankes (Bankus), was a fellow always of ideas of placing concrete with chutes and compressed air.

Q. 13. Did you know him before this work was done on the American Theatre Building?

A. I did, at the Gilsonite Construction Company's yards and stables.

Q. 14. I call your attention to a photograph of the St. Louis Republic February 16, 1908, page 3, "Defendants' Exhibit 1," and will ask if this is the building you have been referring to?

A. Yes, sir.

Q. 15. The upper part of this building seems to be built around a court. How was the concrete carried from one side of this court to the other?

A. With the iron chutes—carried from a cable with block and falls.

[fol. 82] Q. 16. About what was the diameter of these chutes?

A. About eight inches.

Q. 17. What did they look like in section?

A. Well, they were about 6 feet long.

Q. 18. I mean the shape of the cross-section.

A. On a slope.

Q. 19. You have referred to these members as chutes; do you mean that they were open like a coal chute?

A. No, sir; they were round cylinder, open on each end.

Q. 20. How were these pipes supported where you were pouring concrete on the same side of the building as the tower?

A. They were suspended a short distance from the tower with block and falls, a balance resting on horses of different heights.

Q. 21. About how often did you see the building during the time that the concrete was being placed?

A. When the false work was completed on one floor, we poured the concrete, which took from three to four days. We would be taken away to other jobs until such time as the other floors were ready for pouring again.

Q. 22. How many of the different floors did you see being poured?

A. From the trusses over the theater to the roof.

Q. 23. That is, you saw all the intervening floors; is that it?

A. Yes.

Q. 24. About how many floors were there in the hotel building?

A. About fourteen; I am not positive.

Q. 25. About how high was the theater portion, referring to the corresponding floors of the hotel portion?

A. I should say about six floors.

Q. 26. Will you make a rough sketch showing a plan of the build-
[fol. 83] ing, giving the location of the tower, and also an elevation showing how the pipes were suported where they crossed the open court?

A. I have done so.

By Mr. Jones: The sketch is marked for identification "Defendants' Exhibit 13, Webb Sketch of American Theatre Building."

Q. 27. Describe the sketch briefly.

A. Sketch No. 1 is a plan; sketch No. 2 shows chutes suspended over a court by a cable and block and falls; and sketch No. 3 shows the chutes suspended in the court and zig-zagging to floors below carried in the court by block and fall suspended from the cable.

Q. 28. Referring to Fig. 2, what would you do when you wished to deposit the concrete a few feet away from the point where the lower end of the pipe ends in that figure?

A. We would extend our chutes further out.

Q. 29. What would you do if you wished to deposit concrete a few feet to one side of the end of the pipe?

A. Two fellows would pull the end of the chute around.

Q. 30. Then, as I understand it, the different sections of chute were flexibly connected so as to permit each of them to be moved through a certain angle with reference to its adjoining section; is that correct?

By Mr. Hood: Objected to as leading, and not justified by the previous testimony of the witness.

A. Each chute would permit you to move the end of it approximately an angle of about a foot or 14 inches in 6 feet.

Q. 31. And this flexibility is what permits the bend in the pipe shown in Fig. 3; is that correct?

A. That is, but not all in the two sections, as shown in Fig. [fol. 84] 3. That is the idea of the bend of the chutes you would get in going from a distance of about two floors.

Q. 32. Please add another figure—Fig. 4—showing the manner of connecting the adjusting ends of the pipes.

A. Fig. 4 shows the two chutes with the chains and the hooks for their connections.

Q. 34. About what time of the year was the concrete work done on this building?

A. The spring of the year—1906 or 1907, I am not positive.

Q. 35. By refreshing your recollection from "Defendants' Exhibit 1," what year would you saw it was?

A. I had it in my mind it was 1906 or 1907.

Q. 36. I hand you a photograph marked "A-B," accompanied by a second photograph, these photographs having been filed in court in opposition to a preliminary injunction motion last August, and will ask if you can tell anything about them? (Defendants' Exhibit 2.)

A. I recognize the chutes, tower, and also a man in picture A. It is located in St. Louis, corner of Seventh & Market Sts., the American Theatre Building. I also recognize on the other photograph the superintendent, Herman Bankes, the left-hand man in the upper picture. I also recognize the lower photograph of a building under construction at St. Joe, Missouri,

Q. 38. Describe how the pipe was supported in photograph A.

A. It is supported with a cable with a block and fall attached to chute and cable; also the end of the chute supported on a horse.

Q. 39. Please indicate the block or pulley by red ink arrow in photograph A.

A. I have done so. It is indistinct. The end of the rope is tied around the chute about an inch below the arrow.

[fol. 85] Q. 40. Describe the support for the right-hand chute in photograph B.

A. The B photograph shows a block and fall fastened on to the right-hand chute, which leads out from the center of the tower, which chute is open on top.

Q. 41. Did you see the pipes or chutes as used on the roof during the work?

A. Yes, sir, photograph B showing the placing of the concrete on the roof, as indicated by the chutes.

Q. 42. What proportion of the concrete used in the erection of this building was distributed through pipes or chutes, as compared with other methods of distribution?

A. Practically all of the concrete was placed with the chutes.

Q. 43. What was the consistency of the concrete?

A. The concrete was made wet enough to flow through the chutes.

Q. 44. Was it universal practice prior to this time to use concrete as wet as this?

A. Not to my recollection.

Q. 45. What advantage, if any was there in using wet concrete where reinforcing bars were to be embedded in the concrete?

A. It would adhere more to the steel, of which dry concrete has more voids.

Q. 46. Who did the lathing of the American Theatre Building?

A. John A. Roebling Company.

Q. 47. Do you know of any objections ever having been raised to the use of wet concrete?

A. Yes, sir. At the Great Lakes Naval Training Station in the year of 1910, the government preached on dry concrete. I had some difficulty in getting to use the chutes, as Admiral Ross objected to the wet concrete.

[fol. 86] Q. 48. To what extent, generally speaking, have you used chutes for distributing concrete since your experience on the American Theatre Building?

A. Practically ever since the American Theatre was built I have followed nothing else but reinforced concrete; and on practically all the jobs we use the chutes.

Q. 49. What job are you working on at the present time?

A. A factory for Bunte Bros. Franklin Boulevard and Spaulding Avenue. The cost of the building is between $2,000,000 and $2,500,000.

Q. 50. How are you distributing concrete on this building?

A. We are chuting the concrete to receiving hoppers on the floor, suspended from cables, and from there we use buggies.

Q. 51. You mean, do you, that the chutes are suspended from a single inclined cable or a number of cables?

A. The cable for carrying the chutes runs over the head of the big tower, then over two other towers, a distance of about 275 feet. We have two lines of chutes. Also another cable running over the head of the big tower, then over one more, a distance of about 250 feet, which our chutes are strung to.

Q. 52. And after the concrete flows from these chutes to the receiving hoppers, it is then permitted to flow into individual buggies

and wheeled by the workmen to the forms, and dumped in; is that correct?

A. Yes, sir.

Q. 53. I show you another photograph, consisting of three views, dated August 14, 1908, August 29, 1908, and October 16, 1908, and will ask you if you can identify the building shown therein?

A. The photograph showing the three buildings, of different dates, I recognize as a job in St. Joe, Mo., the Tootle-Campbell Building.

[fol. 87] Q. 54. Is this the same St. Joe Building that you referred to in connection with Defendants' Exhibit 2?

A. It is.

Q. 55. Describe the apparatus shown in these various photographs.

A. We distributed the concrete with chutes, also suspended from a cable with block and fall.

By Mr. Jones: The notary is requested to mark the sheet containing the three photographs as "Defendants' Exhibit 14, Photos of Tootle-Campbell Building—1908."

Q. 56. Were you personally employed on the Tootle-Campbell Building?

A. I was employed by the Gilsonite Construction Company.

Q. 57. Do you recognize any of the men in the photograph constituting part of Exhibit B?

A. Yes, sir. I recognize Victor Clarke, Perry Morton—that is about all I recognize distinctly. I know some of the others, but don't recall their names.

Q. 58. Where was the mixer located on this job?

A. In the basement.

Q. 59. Trace the movement of the concrete from the mixer to the forms.

A. The concrete was mixed and dumped into the skip, carried up through the tower to the receiving hopper, thence into the chutes, and distributed on the floor from the ends of the chutes. In Exhibit B you will notice, in the back of the group, horses we used for resting our chutes on when cables are not permitted to be used.

Q. 60. Was the hopper always at the same height throughout the progress of the work?

A. It was not, as the work progressed our receiving hopper was raised high enough to enable us to chute the concrete any place [fol. 88] on the floor, without using wheelbarrows.

Q. 61. Do you know the address of either of the two men you recognized in the photograph?

A. I do not.

Q. 62. If the chutes were extending from one side of the tower, how would you distribute concrete to the space on the other side of the tower?

A. The tower was in about the center of the building; the two cables were run from the tower to the opposite corners of the building. We would change our chute when through with one end to the other end of the building.

Q. 63. How was the hopper raised?

A. With a block and fall.

Q. 64. Do you recall the taking of the photograph, Exhibit 2, showing this building in St. Joseph?

A. Yes, sir. I was there. I recognize the Court House in the back.

Q. 65. Have you any photographs of your own showing either this St. Joseph building or the St. Louis building?

A. I did have. I don't know whether they are down in my mother's, or packed away in my trunk at home, as I have a bunch of my pictures of different jobs that I have been on, at my mother's.

Q. 66. Will you make a search for them, and if you find them let me know?

A. I will.

Q. 67. Prior to the time when you used chutes on the American Theater Building about 1907, and the Tootle-Campbell Building about 1908, had you ever seen chutes used for conveying concrete?

A. Yes, for a short distance of eight or ten feet.

Q. 68. Do you know R. H. Hughes?

[fol. 89] A. Yes, sir. I never met him on any of these jobs that I know of.

Direct examination closed.

Cross-examination by Mr. Hood:

X Q. 69. Referring to photograph marked A, forming part of Defendants' Exhibit 2, there appears to be a grid or platform of I-beams under the wooden frame-work which supports the hopper; is that right?

A. That appears to be a bunch of loose I-beams.

X Q. 70. What supports the downwardly-flaring wooden legs which run up to a point under the hopper?

A. They are resting on the I-beams.

X Q. 71. And what do the I-beams rest on?

A. The I-beams rest on a column. They are riveted together at an intersecting point, where the four beams come together, or where two intersecting into the center of one beam or girder.

X Q. 72. Well, these loose I-beams that one can see so plainly in the photograph are not in permanent position, are they?

A. That I don't know.

X Q. 73. The wooden hopper supporting frame with legs that flare out toward the observer in this photograph rested on the steel frame of the building; is that right?

A. Yes, sir.

X Q. 74. And in Photograph B it appears quite plainly that the upper end of the cable, from which the open chute is suspended by the block and fall, is attached to a wooden cross-bar at the front side and near the top wooden hopper supporting frame; is that right?

A. It appears so in the picture.

X Q. 75. And you find the same construction, somewhat indis-
[fol. 90] tinctly in Photograph A of Defendants' Exhibit 2, do you?
A. I don't see the cable attached there.
X Q. 76. Now, in Photograph B of Defendants' Exhibit 2, there are three chute lines leading off from a point just below the discharge mouth of the hopper, one of these lines being an open chute which leads straight out from the face of the tower, and the other two lines being enclosed pipe chutes, that is, pipes of circular cross-section leading off in opposite directions from the point below the hopper; is that right?
A. That is right.
X Q. 77. And these various chute lines were supported at their upper ends by the wooden frame, which you say rested on the steel framework of the building; is that right?
A. Yes, sir.
X Q. 78. I suppose that when one of these chutes was being used the others were disconnected; is that right?
A. In the iron chutes there was a gate to allow the concrete to flow only out of one chute at a time.
X Q. 79. So that these three chutes were all connected at their upper ends and a gate provided to direct the flow of concrete into one or the other of the chutes?
A. I don't say that the wooden chute is connected at the same time that the two iron chutes are.
X Q. 8. Which is the wooden chute?
A. The open chute is the wooden chute.
X Q. 81. And when the wooden chute was used, the upper ends of the iron chute were pushed to one side, so that the wooden chute could be placed in position to receive the concrete from the hopper?
A. It was.

Cross-examination closed.

[fol. 91] Redirect examination by Mr. Hood:

R. D. Q. 81a. Referring again to Photograph A and from your recollection of the apparatus, is it not a fact that the hopper is supported on the tower, and that the downwardly-flaring wooden legs that Mr. Hood has referred to simply aid in bracing the tower?
A. To my best recollection, the hopper was supported by a framework built from the tower and also from the floor.
R. D. Q. 82. The hopper appears to be supported on brackets comprising horizontal members and inclined members running inwardly towards the tower, does it not?

By Mr. Hood: Objected to as leading.

A. As I stated before, to my best recollection the hopper was supported from the floor and also the tower.
R. D. Q. 83. When the hopper was supported in one of the lower positions you have referred to, was it connected with the tower, so that the concrete could be dumped into it from the hoist bucket?
A. The receiving hopper sets up against the tower.

R. D. Q. 84. Would it be correct to state that the cables from which the chutes were hung were supported by the tower in such cases where they did not connect with some part of the steel structure?

By Mr. Hood: The question is objected to on the ground that this witness has not stated anywhere that the cable, from which the chutes were suspended, was not connected to the steel framework; on the contrary the witness has testified that the outer end of this supporting cable was anchored to the steel framework of the building.

[fol. 92] A. The cables that supported the chutes, or carried the chutes, were in all cases fastened to the tower where convenient to fastent, and run from there to the most convenient place to fasten to a steel column, girder, or anything substantial to hold the weight; and on a short chute in close quarters, where we were rushed with concrete, we would fasten the cable at the most convenient place we could find.

R. D. Q. 85. In other words, you adopted various expedients, depending on the character of the problem that had to be met; is that correct?

A. Well, I just stated briefly our way and the way we fastened the cables when spouting concrete.

Redirect examination closed.

Recross-examination by Mr. Hood:

R. X Q. 86. You have been asked about the hopper when it was supported in one of the lower positions. The hopper was supported in those lower positions in the same way as is illustrated in Photograph A of Defendants' Exhibit 2, was it not?

By Mr. Jones: Objected to, as the witness has given no testimony to that effect.

A. I would state from all appearances of the photograph that they are the same structures.

R. X Q. 87. In all positions of the hopper, it was partly supported by supporting legs which rested upon the forms for the floors of the building or upon the steel framework of the building; that is right, isn't it?

A. Upon the steel framework to my best knowledge. It was fastened on to the tower.

R. X Q. 88. That is, the hopper was supported in part by the tower by being fastened to it, and part of the hopper farthest out from the tower is also supported by the wooden legs or frame ex- [fol. 93] tended down and rested on a part of the steel framework of the building; that is right, isn't it?

A. That is the two supports, or the two legs, that hold up the outer part of the hopper, rest on the steel frame I-beams of the building, of which the legs are fastened onto the tower, with X-braces,

ribbons, and extra legs running out from the tower to the front part, or toward the front part, of the hopper.

R. X Q. 89. Now, on the sketches which you have made and which have been marked "Defendants' Exhibit 13," you didn't make any effort to make any indication of these supporting legs, did you?

A. No, sir, I did not, as I was not asked that question at that time. I was asked to show the lay out of the chutes and cables,—as to how they were strung across the court way, and also down to different floors.

Recross-examination closed.

Redirect examination by Mr. Jones:

R. D. Q. 90. Where you say "of which the legs" in your answer to R. X Q. 88, are you referring to the diagonal braces supporting the frame for the hopper on the tower?

By Mr. Hood: The question is objected to as assuming; there is no proper foundation in the testimony.

A. The arm marked in red ink with an X is a support for a platform for a man to stand on, or to work off, when connecting or disconnecting his chutes, and is built strong enough for a ribbon of 2 x 8 nailed across so as to help carry the chute.

R. D. Q. 91. And these diagonal braces X, of which there are two, also help to support the framework for the hopper through the [fol. 94] vertical supports Y, do they not?

A. The Y-brace referred to, in red ink in Photograph A, is not built for support for carrying the receiving hopper.

R. D. Q. 92. What do the two vertical posts Z support, and are they or are they not part of the tower?

A. They are supports that run up from the I-beam to the outer corners of the hopper on the outside, are supports for the hopper, and are fastened onto the tower with X-braces and ribbons, and also arms extended out from tower to the outside leg of the receiving hopper. W is an arm running out from the corner of the main tower to the outside leg of the receiving hopper.

R. D. Q. 93. As the result of this construction, is it correct to state that the hopper is supported in part by the tower and to some extent by the steel framework of the building?

A. It is.

Deposition closed.
Signature waived.

Adjourned until Thursday, December 30, 1920, at 10 a. m.

December 30, 1920.

Parties met pursuant to adjournment. Present, as before.

WILLIAM T. MCCANN, a witness produced, sworn, and examined on behalf of defendants, deposes and testifies as follows in answer to interrogatories by Mr. Jones:

Q. 1. Please state your name, age, residence, and occupation.

A. William T. McCann; fifty-seven years; 652 W. Sixtieth St., [fol. 95] Chicago, Illinois. I am a carpenter with the Great Lakes Dredge and Dock Company.

Q. 2. How long have you been with this company?

A. About nineteen years or more.

Q. 3. In what part of the country have you worked during most of this period?

A. Chicago, Gary, Hammond, Sault St. Marie (Mich.), and Cleveland (Ohio).

Q. 4. I call your attention to Photograph Album No. 36, having the name Great Lakes Dredge & Dock Company on the cover, and will ask you to look at photograph 10,835 therein and state if you know anything about the work which the picture represents?

A. I do. Putting in a water intake.

Q. 5. Where was this intake?

A. Gary.

Q. 6. About when was this work done?

A. We started on the work in 1907.

Q. 7. Have you any way of determining that the year was 1907, aside from the date on the photograph?

A. The year of the panic, 1907,—the year that they got paid in script.

Q. 8. If you know what the apparatus is at the lefthand side of the picture, please describe it.

A. A concrete mixer. That is the machine erected for transferring concrete from mixers to forms by chutes.

Counsel for complainants objects to this line of testimony as relating to a structure and operations not pleaded in the answer, and it is understood that the objection may lie without repetition to all questions and answers relating thereto, subject, however, to previous stipulation relative to the taking of depositions prior to amending the answer.

[fol. 96] Q. 9. Where are chutes in the photographs?

A. The photograph don't show the chutes.

Q. 10. Explain why.

A. The machine was not working when the picture was taken.

Q. 11. Why wasn't it working?

A. Excavation was being done and concrete forms not built.

Q. 12. Was this machine ever used for transferring concrete from the mixers to the forms by chutes?

By Mr. Hood: It is suggested to counsel for defendants that the questions should be of less leading character.

By Mr. Jones: The question was based directly on the answer to Q. 8, stating that the machine was erected for this purpose.

A. The chutes carried the concrete from the mixer to the forms.

Q. 13. When did they do this?

A. I don't get that.

Q. 14. Please state the year in which they did this first.

A. In 1907.

Q. 15. About what part of the year would you say that this apparatus was first used in this manner?

A. In March.

Q. 16. What makes you think it was March?

A. We had labor troubles that year.

Q. 17. Do you know anything about the trestle shown in this photograph?

A. I do. I remember working on that trestle work on a Sunday. It was an emergency job.

Q. 18. Do you remember how long it took to finish the trestle or bridge structure?

[fol. 97] A. We completed it some time through the night—before Monday morning.

Q. 19. Do you remember why this was an emergency job, or anything else about it?

A. I can't recall.

Q. 20. What was the condition of the work on the far side of the bridge in the photograph at the time the picture was taken, presumably June 19, 1907, the date on the photograph?

A. That was the pumping station (witness indicates a building in the background). Concrete, probably three or four hundred feet, from the starting point of that building.

Q. 21. Explain a little more fully what you mean.

A. It is a water intake from a water slip of concrete construction.

Q. 22. How was this concrete put in place?

A. Concrete mixer and chutes.

Q. 23. Was the work you have just referred to done before or after the bridge was built?

A. Before.

Q. 24. How were the chutes supported?

A. One end was fastened to the mixer, and one end to the boom of some of the chutes. Some chutes were blocked by wooden trestles.

Q. 25. If the boom is shown in the photograph, please point to it.

A. The boom is attached to the mixer shown in the photograph.

Q. 26. How was this boom supported at its lower end?

A. It was supported by an eye-bolt and a clevis.

Q. 27. What was the purpose of this arrangement?

A. To move chutes to different positions for concrete construction.

[fol. 98] Q. 28. What did the eye-bolt and clevis have to do with moving the chutes?

A. So the boom could be swung.

Q. 29. What was the relation between the boom and the chutes, which you say were moved to different positions?

A. It was to give a loose end on the boom, so as to give freedom to swing the boom for moving the concrete chutes to different positions.

Q. 30. Then, as I understand this answer and your answer to Q. 24, these chutes you have referred to were fastened to the boom so as to swing when the boom would swing; is that correct?

A. Yes.

By Mr. Hood: Objection is made to leading questions and alleged interpretations of the testimony of the witness.

Q. 31. Who built the apparatus in which the mixer appears to be mounted?

A. I have.

Q. 32. Who else was connected with the building of this apparatus?

A. Mr. Cameron—I think his name is A. C. Cameron. We called him Sandy.

Q. 33. What is the box-like wooden affair projecting apparently from the side of the mixer structure toward the observer?

A. That is for conveying concrete from mixer to chute.

Q. 34. How was this done with this apparatus?

A. By placing at discharge of mixer.

Q. 35. How was it placed there?

A. It was fastened to the framework of the mixer at one end, the other end on blocking, and in different ways, as near as I can remember.

[fol. 99] Q. 36. Where was this other end with reference to the chute you have referred to?

A. That would be on the blocking, and in other ways of holding it in position.

Q. 37. Please trace the flow of the concrete from the mixer to its final position, that is, state through what it flows.

A. Concrete chutes.

Q. 38. Did it or did it not flow through what I have referred to as a box-like affair, which you have been describing?

A. Yes.

Q. 39. On what was the mixer supported?

A. It was supported on four railroad car wheels and axles.

Q. 40. Did it remain in the same position, or was it moved about?

A. It was moved about.

Q. 41 Before you saw this apparatus we have been talking about, had you ever seen a chute of any kind supported from a boom through which material would slide or flow?

A. I have around grain elevators.

Q. 42. Had you ever seen such apparatus before with concrete flowing through it?

A. I can't recall.

Q. 43. After you made this apparatus and saw it used, did you ever see any apparatus consisting of a chute hung from a boom, with concrete flowing through the chute?

A. I have.

Q. 44. Where?

A. In the Municipal Pier. I don't recall other places.

Q. 45. Have you ever seen any other apparatus intended for this purpose?

A. Yes, I saw other apparatus.

[fol. 100] Q. 46. I call your attention to an album, No. 37, Photograph 967, and will ask if you are familiar with the apparatus there shown?

By Mr. Hood: Objected to as relating to a structure and operations not pleaded.

A. I can't place that job.

Q. 47. I call your attention to Album 31, Photograph 14,582, and will ask if you have ever seen that or similar apparatus?

By Mr. Hood: Objected to as relating to a structure and operations not pleaded.

A. I saw similar apparatus—I don't know whether it would be the same as that.

Q. 48. Where did you see similar apparatus?

A. Here in the Chicago River.

Q. 49. Please note Album 29, Photograph 14,875, and state whether you have ever seen apparatus such as illustrated near the end of the sea wall.

By Mr. Hood: Objected to as relating to apparatus and operations not pleaded.

A. I am not positive that I know anything about that.

Q. 50. I show you a 1912 catalogue of the Great Lakes Dredge & Dock Company, marked "Copyright, 1912," and will ask if you have ever seen apparatus such as illustrated on pages 32 and 33 thereof?

By Mr. Hood: Objected to as irrelevant and immaterial.

A. I never was on that work.

Q. 51 About how long after the bridge in picture 10,835 was built would you say that you were ready to continue the concrete work, which I understand had been carried up to or nearly to the bridge?

A. About a week or ten days, or it may have been longer.

[fol. 101] Q. 52. Do you know where the concrete chutes were at the time this picture was taken?

A. I don't remember just what part of the job they laid on, as they were not in use at the time the picture was taken.

Q. 53. Was there any particular secrecy about the use of this mixer, chutes, and boom during the time that this work was being carried on?

A. Not that I know of or can remember.

Q. 54. Do you recall about how long this apparatus was used on this job?

A. From along some time in March until October, as near as I can remember.

Q. 55. What can you say with reference to the volume of work done in the fall of 1907, as compared with the early part of the year?

A. I can't recall.

Q. 56. You referred to the fact that 1907 was the panic year. Did the panic have any effect on the amount of work which your company did during that year?

A. Not that I know of.

Q. 57. Did it have any effect on the number of men employed on the job?

A. Every job seemed to go along as weather permitted until completed.

Q. 58. After the jobs were completed, were there many new jobs?

A. I do not know.

Q. 59. Would you say there were as many men employed during the winter at the end of 1907 as there were during other winters?

A. There were not as many employed.

Q. 60. About when did you first see what might be called a [fol. 102] "tower" mixer, that is, one similar to what is shown in Photograph 14,582, comprising a tower in addition to the other parts?

Counsel for plaintiffs suggests that questions of this sort should be asked the witness, if at all, without at the same time showing him dated photographs. The question is objected to, in view of the display of the photograph, as leading.

A. About 1914, in Sault St. Marie, Michigan.

Q. 61. Was that apparatus on land or water?

A. Water.

Q. 62. Do you know Messrs. Fucik, Lutz, Lyden, and Murphy? If you do, please state who they are.

A. Mr. Lyden was president of the Great Lakes Dredge & Dock Company; he is dead now. Fucik is an estimating engineer, as near as I know, for the Company. I have known him in charge of work. Lutz is vice-president of the Company. Captain Murphy is general superintendent of construction, Chicago Division.

Q. 63. What men were familiar with the Gary pumping station intake job of Photograph 10,835, besides yourself and Mr. Cameron?

A. John R. Williams. There is an man named A. C. Andrews. I can't think of anybody else that you can locate now.

Q. 64. What is the small V-shaped inclined structure shown in this same photograph, having apparently ropes extending from it to the roof over the mixer?

A. Two bracings put on there.

Q. 65. What use was made of this bracing?

A. When we were transferring the mixer south of the trestle work.

Q. 66. What happened when you were making this transfer?

[fol. 103] A. Instead of running concrete mixer on rails, we transferred it with a locomotive crane.

Q. 67. What did this have to do with the bracing?

A. To hold boom and clearance of slings to raise concrete mixer with locomotive crane.

Direct examination closed.

Cross-examination by Mr. Hood:

X Q. 68. In this Photograph No. 10,835, on the under side, near the outer end of the part you have called a V-shaped bracing, there is a double pulley fall block; what was that for?

A. That ain't no fall block; it looks like a rope knotted together.

X Q. 69. You are right sure that there wasn't any double pulley block on that part of the structure, are you?

A. I am.

X Q. 70. And it is your recollection that this part that you have called a V-shaped brace was used to fasten the long boom to keep it from swinging when the mixer and its car was picked up bodily by the locomotive crane and transferred from the north side of the bridge to the south side?

A. Yes.

X Q. 71. Now, isn't it a fact, Mr. McCann, that the large boom on this mixer structure could only be swung up and down, and could not be swung from side to side?

A. No. It was built to swing, and it did swing.

X Q. 72. Did it swing up and down?

A. No, it was lowered and raised with block and tackle.

X Q. 73. You are quite sure that this larger wooden boom could be swung from side to side, are you?

A. Yes.

[fol. 104] X Q. 74. Just how was it supported on a mixer car, so that the side movement could be obtained?

A. By an eye-bolt and a clevis-shaped iron.

X Q. 75. The clevis was on the boom, was it?

A. Yes, sir.

X Q. 76. And the bolt was parallel with the ground and passed through the clevis on the boom; is that right?

A. Yes, that is right.

X Q. 77. And the eye-bolt was fastened in that heavy vertical post, against which the lower end of the boom appears to rest, didn't it?

A. As near as I can recollect.

X Q. 78. And the shank of the eye-bolt was parallel with the ground, wasn't it?

A. Yes.

X Q. 79. And the post was an upright post?

A. Yes.

X Q. 80. Now, what you call a clevis was a pair of wrought iron straps fastened to the sides of the lower end of the boom and projected a few inches beyond the lower end of the boom, each being provided with a hole through which the horizonal bolt was passed; that is right, isn't it?

By Mr. Jones: This line of questioning is objected to as too leading even for cross-examination; and it is suggested that the witness be first asked to describe this apparatus as fully as possible to lay the basis for further detailed questions.

A. No.

X Q. 81. What do you mean by a clevis?

A. An iron with a circular end on it—two straps with a circular end.

X Q. 82. Does the clevis show in the photograph?

A. Yes.

[fol. 105] X Q. 83. Is it that piece of iron at the lower end of the boom somewhat narrower, say, about one-half the width of the boom and projecting a few inches beyond the lower end of the boom?

A. Yes.

By Mr. Hood: Counsel for defendants is asked whether he expects to offer a copy of this Photograph 10,835 in evidence?

By Mr. Jones: Yes, copies of this and a number of other photographs are now being finished and will be marked for identification as soon as received.

X Q. 84. You have said something about this wooden trough, which appears to be located at the top end of the mixer car. Are the heavy square timbers which project outwardly and upwardly just beneath this trough-like structure parts of the t-ough structure?

A. Yes.

X Q. 85. Was this trough-like structure ever used in the position shown in the photograph?

A. No.

X Q. 86. Now, it is your recollection that this trough-like structure when to be used was shifted from the position shown in the photograph to a position at the boom side of the mixer car, so as to project straight out from that side, and that it was supported upon blocking so as to receive the discharge from the mixer. Is that right?

A. Yes.

X Q. 87. That was a pretty awkward sort of a structure to handle, wasn't it?

A. Not very.

X Q. 88. How was it shifted from the position shown in the photograph into position to receive concrete from the mixer?

[fol. 106] A. By hand.

X Q. 89. Just how was the chute section supported from the boom?

A. By block and tackle.

X Q. 90. This trough-like device shown in the photograph was not supported from the boom, was it?

A. No.

X Q. 91. And the trough section that you say was supported by the boom was also supported by blocking under it, wasn't it?

A. Yes.

X Q. 92. Do you remember just what sort of a connection was made between the block and tackle and the chute, which you say was supported by this block and tackle from the boom?

A. It rested on blocking.

X Q. 93. The intake line under construction, as shown in this photograph 10,835, was on the property of the Great Lakes Dredge & Dock Company, was it?

A. I don't know who owned that property that the intake went through. I understood that it belonged to the Steel Company.

X Q. 94. Was there a fence round the property?

A. No.

Cross-examination closed.

Redirect examination by Mr. Jones:

R. D. Q. 95. Did the vertical post, in which you say the eye-bolt was fastened, turn with the boom or was it stationary?

By Mr. Hood: Objected to as leading.

A. Stationary.

R. D. Q. 96. Explain a little more fully the arrangement of eye-bolt, horizontal bolt, and iron st-aps, as the result of which this boom [fol. 107] was able to swing from side to side in the manner which you have described.

A. Circular end iron strap passed through horizontal eye-bolt.

R. D. Q. 97. Can you make a rough pencil sketch of this scheme?

A. I am a very poor sketcher. (Witness makes sketch.)

The sketch is marked for identification "Defendants' Exhibit 16 McCann Sketch."

R. D. Q. 98. Before you rigged up this apparatus, had you ever seen a boom mounted so it could swing up and down and also swing sidewise?

A. Yes.

R. D. Q. 99. How many times?

A. I don't remember how many times—quite often.

R. D. Q. 100. Was this arrangement which you have just sketched materially different from the arrangement which you say you had quite often seen on other booms?

A. No.

R. D. Q. 101. Is your eye-sight poor, fair, or excellent would you say?

A. Fair.

R. D. Q. 102. After the mixer had been moved to the near side of the bridge shown in the picture referred to, was the boom ever swung from side to side with the chutes suspended from it in the manner that you have previously described?

A. Yes.

R. D. Q. 103. Was the mixer always moved by means of the crane?

A. No.

R. D. Q. 104. How was it moved?

A. On rails. It was built on a car.

Redirect examination closed.

[fol. 108] Recross-examination by Mr. Hood:

R. X Q. 106. Along the middle line of metal straps which are fastened to the wooden beam in photograph 10,835, there appear to be three projections or bumps; can you see those in the photograph?

(Witness uses magnifying glass.)

A. I can't see.

R. X Q. 107. What was the boom made of?

A. Two by twelve.

R. X Q. 108. Wooden timbers on edge, close together at their ends and bowed in the middle by three wooden cross pieces, upon which the main two by twelves were clamped by iron cross bolts; is that right?

A. Yes.

R. X Q. 109. And the narrow piece that appears to be bolted to the side of the two by twelve at the lower end was about 6 inches wide and 20 or 24 inches long, and of wrought iron; wasn't it?

A. Yes.

R. X Q. 110. About how thick was it?

A. I should judge half by three, and then the blacksmith worked it in the center.

R. X Q. 11. Don't you see the bolt head right down almost at the lower end of that metal plate?

A. No, I can't see it.

Recross-examination closed.

Deposition closed.

William T. McCann.

Adjourned until 2 p. m.

[fol. 109] Alexander Cameron, a witness produced, sworn, and examined on behalf of defendants, deposes and testifies as follows in anwser to interrogatories by Mr. Jones:

Q. 1. Please state your name, age, residence and occupation.

A. Alexander Cameron; fifty-six years; 6437 Ellis Avenue,

Chicago, Illinois. I am general foreman or superintendent for the Great Lakes Dredge & Dock Company.

Q. 2. About how long have you been with this company?

A. I should say seventeen or eighteen years at the very least.

Q. 3. Did you have anything to do with the work on the intake at Gary, Ind.?

A. I was sent there in the fall of 1906—in November—to take charge of constructing that intake and coffer dam as well.

Q. 4. Did this work involve the placing of any concrete?

A. The pumping station must have taken about 2,500 yards.

Q. 5. Describe briefly the apparatus used in placing the concrete on this job.

A. A Smith mixer, built on a low flat car, with a platform on top leading to gondola cars, to be used for mixing concrete.

Q. 6. When did you first see this apparatus?

A. That was the first time that I had seen it.

Q. 7. What time was that?

A. That was along the latter part of November, 1906.

Q. 8. Explain more fully how the concrete was carried from the mixer to its final position.

[fol. 110] A. We discharged our concrete out of the mixer into a large mouthed hopper, which was fastened from the end of this hopper, chutes were attached to that running down into our coffer dam.

Q. 9. How were the chutes supported?

A. The chutes were fastened with ropes or wires—I am not quite clear—I should have said that the chutes were carried by a boom, attached to our car—that is, the concrete car—and the chutes were supported by tackles.

Q. 10. Can you produce a sketch illustrating this apparatus?

A. I can. Here is the kind of a tackle that carried and supported my chutes.

Q. 11. When did you make this sketch?

A. Last night.

Q. 12. Please put numbers on the different parts of the apparatus with red ink, and state what the numbers refer to—1, 2, 3, &c.

A. 1 is the mixer, 2 is a car, 3 is a boom, 4 is tackles, 5 is chutes, 6 is a coffer dam, 7 is a trestle, 8 is a hopper, 9 is tackle, 10 is a mast, 11 is a chute.

By Mr. Hood: The question is objected to as relating to a structure and operations not pleaded.

Q. 13. Please refer to the sketch, and explain again how the concrete gets from the mixer into the coffer dam.

A. We load our material into wheelbarrows and cars and wheel it to the mixer, where it is mixed up to its proper mixture and dumped out into those chutes 5 and 11, and placed in the bottom of the coffer dam 6.

Q. 14. How long do you keep this up?

A. Till we complete it at the pumping station.

Q. 15. Does the concrete simply flow out of the lower chute 11 into a single pile?

[fol. 111] A. Yes; it flows out of the bottom chute and poured into a pile, or poured into its place.

Q. 16. Am I correct in understanding from this that the chute remains in the same position until the pumping station job is completed?

A. No, we move it round as occasion requires.

Q. 17. Which one of the two chutes in the sketch do you move?

A. 11.

Q. 18. After you have moved the lower chute 11 until it has reached as far as possible, what do you do when you deposit the concrete at some more distant point?

A. Put on other chutes, similar to 11, or if the distance is shorter put on shorter chutes.

Q. 19. About how big was this coffer dam?

A. About 38 or 40 feet in width and about 100 feet in length.

Q. 20. How was the upper part of chute 5 connected with the mixer 1?

A. I am not quite clear. This hopper was set in and fastened on the car.

By Mr. Hood: It is understood that the objection previously entered to this line of questions may be considered to the entire line.

Q. 21. Where is the hopper on this sketch?

A. I didn't take really time to place it out as it would look on the car—I was in too much of a hurry.

Q. 22. Please draw it now to show roughly where it was.

A. I have done so to the best of my knowledge, and have marked it 12.

Q. 23. Did the chute 5 project at a fixed angle from the car, or could it be moved in any way?

A. We could move it up and down with our tackles, and also move it sideways.

[fol. 112] Q. 24. After you completed the coffer dam, what became of this concrete mixing and distributing apparatus?

A. We took that mixer around and placed it on the side of the open cut or big ditch where we were putting in a two 10-foot bore intake.

Q. 25. About when was it moved?

A. Some time about the last of March or first of April; to my best knowledge, in 1907.

Q. 26. Can you produce a photograph showing the apparatus you have referred to?

A. Yes, sir. (It is 10,835 of album 36.) I recognize the picture, but my sight is too poor to read the number.

It is stipulated that reproductions of this and other photographs of the Great Lakes Dredge & Dock Company may be used in evidence with the same force and effect as the originals, with the un-

derstanding that the originals will be produced at the hearing, and upon reasonable notice whenever called for by counsel for plaintiffs.

The notary is requested to mark the reproduction of this photograph "A" and to bind it in a binder marked "Defendants' Exhibit 17, Great Lakes Dredge & Dock Company's Photographs."

Q. 27. Explain how this apparatus shown in the photograph was used in the work on the cut or ditch.

A. A system of chutes running from the mixer down into the intake, similar as into coffer dam.

The notary is requested to mark the witness's pencil sketch "Defendants" Exhibit 18, Cameron Sketch."

Q. 28. Are you known by any other name than Alexander Cameron?

A. Sandy.

Q. 29. Do you recall any special incident in connection with the work shown in this photograph?

[fol. 113] A. There is nothing that I can think of.

Q. 30. Who built the bridge or trestle shown in the picture?

A. The Great Lakes Dredge & Dock Company.

Q. 31. Did you have anything to do with it?

A. I had charge of it and supervised the building.

Q. 32. Do you recall any of the circumstances in connection with the building of it?

A. Only that we were asked on Saturday if we could complete the trestles by the following Monday; and if we didn't we would be fined $100 an hour for every hour that we held the concrete company—Lanquist & Illsley, I think it was.

Q. 33. Did you finish the work in time?

A. Yes, sir, we finished at 6 o'clock Monday morning.

Q. 34. Was this concrete-distributing apparatus used on both sides of the bridge in the picture?

A. Yes, sir, 300 feet west of the bridge, and 300 feet east of bridge to slip.

Q. 35. Where are the chutes shown in this photograph?

A. They are probably laying west of the bridge, as we are not in shape to pour concrete, as the picture will show.

Q. 36. What was necessary before you could pour?

A. Jet in sheeting underneath trestle, and erect forms for placing concrete.

Q. 37. About how long was this apparatus used on this job?

A. Five or six months, to the best of my knowledge.

Q. 38. About how long was it used on the first job you spoke of?

A. Between three and four months, to the best of my knowledge.

Q. 39. Before you saw this apparatus in the fall of 1906, had you [fol. 114] ever seen either chutes or pipes hung from a boom for the purpose of allowing material of some kind to slide down them?

A. No.

Q. 40. I was not referring to concrete particularly, but to any kind of material.

A. I saw chutes hanging on a grain elevator, that is all I saw.

Q. 41. Then this was the first time that you had seen chutes hung in this manner for the distribution of concrete; is that correct?

A. That is correct.

Q. 42. Have you ever seen apparatus of the kind shown in album 37, picture 967?

By Mr. Hood: Question objected to for previous reasons, and as relating to matter not pleaded, and it is understood that the same objection may be considered as entered without repetition to all apparatus of the Great Lakes Dredge & Dock Company, whether in the examination of this witness or any other witness.

A. Yes, sir. We used that for mixing concrete and placing concrete for concrete dock, in turning basin and slip used by the Inland Steel Company, of Gary, Ind.

By Mr. Jones: A reproduction of the photograph is marked "B" and included as part of Defendants' Exhibit 17.

Q. 43. Do you know who built this outfit?

A. The Great Lakes Dredging & Dock Company.

Q. 44. Did you have anything to do with it?

A. I had charge of it, and supervised the building of it.

Q. 45. Do you remember about when it was built?

A. The latter part of 1907 or the first part 1908.

Q. 46. How do you remember this general period of time?

[fol. 115] As it was the year of the panic, and we laid off quite a lot of men, and just kept a few to do necessary repairs around our fleet, which was laying in the harbor.

Q. 47. What did this have to do with building the apparatus?

A. We built it that winter.

Q. 48. Do you mean that you built it while you had just a few men around?

A. Just a few men during the winter, working when weather permitted.

Q. 49. Was business good or bad at the time for your company?

A. It was very bad.

Q. 50. Is this mixer on land or water?

A. On water. A scow 32 feet in width and 100 feet in length, I am pretty sure.

Q. 51. Describe the main elements of the apparatus on this scow.

A. Well, there were four or five bents set up on the scow, floor over, and hoppers built on top, for material mixed into concrete and poured out into concrete dock.

Q. 52. Did the concrete flow directly from the mixer to the dock?

A. Through a system of chutes.

Q. 53. How were the chutes supported?

A. A mast placed on front of mixer, supported on the scow, and a boom placed on this mast and hung by tackle and carried a chute.

Q. 54. Please mark on photograph B with red ink to indicate the mast, the boom, and the chute you have referred to.

A. The boom is not shown in the picture. I have marked the mast and the chute.

Q. 55. Please state what you call the projecting part which I have marked with an arrow in the photograph.

[fol. 116] A. That is the boom I have been talking about (witness using magnifying glass). I couldn't see it with my eyes. I now mark it "boom."

Q. 56. Who suggested the mounting of this mixer, boom and chute on the scow?

A. I recommended building a mixer like the one in the picture to Mr. T. C. Lutz, general superintendent for the Great Lakes Dredge & Dock Company.

Q. 57. About when did you conceive this idea?

A. About the middle of the summer of 1907, when I was informed by Mr. Lutz that I was to take charge of building the concrete dock around the turning basin and slip.

Q. 58. About how soon after it was built was it used?

A. About April 15th, or 16th, to the best of my knowledge, of 1908.

Q. 59. Was it successful or unsuccessful in operation?

A. Very successful.

Q. 60. How long was it used?

A. We completed all the work round the turning basin and slip at Gary, and was towed to the South Chicago Illinois Steel Company, and there done quite a lot of work, but I don't know how much, as I wasn't in charge of that job.

Q. 61. Has it ever been used since?

A. I am not clear.

Q. 62. I show you album 31, photograph 14,582, and will ask if you have ever seen apparatus of that character in use?

A. Yes; I had charge of and helped to erect that exhibit at the Iroquois Steel plant at South Chicago.

The notary is asked to mark the reproduction of this photograph "C," and include it as part of "Defendants' Exhibit 17."

[fol. 117] Q. 63. In this apparatus, where is the concrete mixed?

A. In a concrete mixer in the inside of a house. It cannot be seen, as it was closed up.

Q. 64. Where is the mixer with reference to the tower?

A. Right back of the tower.

Q. 65. How did the concrete get from the mixer to the forms?

A. It is dumped out of the mixer into a bucket, and conveyed up with a cable in a bucket, and dumped into a hopper which is fastened on the tower; and we have one 50-foot section of 12-inch pipe carried by two booms and fastened on the bottom of the hopper, and as occasion requires placing concrete in forms, we have 8-foot sections or 10-foot sections to take on or off.

Q. 66. How could you change the point of delivery of the lower end of the pipe?

A. By adding on a section 10 feet long, or taking it off, as occasion required.

Q. 67. Was there any other way to change the point of delivery?
A. By swinging booms and swinging pipe.
Q. 68. Was this apparatus successful?
A. Very successful.
Q. 69. I call your attention to album 32, photograph 14,724, and will ask if you are familiar with that apparatus?
A. It is similar to the one I have just described.

The reproduction of the photograph is marked D and made part of Exhibit 17.

Q. 70. Are you familiar with the apparatus of photograph 14,875 in album 29?
A. It is also one of our floating mixers—one of those mixers that I have just described for placing concrete on a dock.
[fol. 118] Q. 71. How long have you been using tower mixers of this floating type?
A. They have been in use since the building of those mixers at the Iroquois plant.

The reproduction of the photograph is marked E, and made part of Exhibit 17.

Q. 72. I call your attention to a catalogue of the Great Lakes Dredge & Dock Company, marked "Copyright 1912," and will ask if you are familiar with the concrete-distributing apparatus shown on pages 32 and 33?
A. Yes, I am familiar with those two mixers that I see there.

This catalogue is marked for identification "Defendants' Exhibit 19, 1912 Catalogue of Great Lakes Dredge & Dock Company."

Q. 73. Can you give the names of any parties who may have seen the mixer of Exhibit 17, print A, in operation?
A. John R. Williams, our manager; R. E. Rowley, Mr. Cruitz, chief inspector for the Gary Steel Company, and Stephen Cruitz, his son, inspector.
Q. 74. Do you know William McCann?
A. Yes, I know Mr. McCann; he was our carpenter boss, building the pumping station and the intakes at Gary, Ind.
Q. 75. Have you always been located in Chicago during your connection with your company?
A. No, I was sent to Toledo, Ohio, to help out on some work there, and afterwards was sent to Canada, Sault St. Marie, to help out on a cave-in on a dock there, and I afterwards was sent to Troy, N. Y., to build a steel dock there in the Hudson River.
Q. 76. Have you seen any of the concrete-distributing apparatus [fol. 119] of the Great Lakes Dredge & Dock Company, including a concrete chute hung from a boom, in any of these cities outside of Chicago and vicinity?
A. Yes, in Toledo, I saw one while they were building the C. H. & D. dock there.
Q. 77. Was this before or after the building of the Iroquois plant?

A. That was before, I think—I am pretty sure. I went to Toledo, I think, in 1910, I am not sure.

Q. 78. Was any special effort made to keep secret the use of the mixer you say you used on the intake job in the fall of 1906 and the spring of 1907?

A. No, sir.

Q. 79. Do you know Captain Murphy?

A. Yes, sir, he is superintendent of the Chicago division of the Great Lakes Dredge & Dock Company.

Direct examination closed.

Cross-examination by Mr. Hood:

X Q. 80. You used the same mixer and chuting apparatus in building the intake line at Gary that you say you used during the preceding fall in connection with the coffer dam at Gary; did you?

A. Yes, sir.

X Q. 81. That is, you just took the same apparatus, comprising a mixer car, with its boom, and a hopper and chute that you had used in building the coffer dam, and put it on a track alongside of the ditch in which you built the intake?

A. Yes, sir, that is correct.

X Q. 82. The mixer in that apparatus discharged into an open top wooden trough that was built on some heavy timbers, and was wide at one end and narrow at the other; that is right, isn't it?

A. That is the right.

[fol. 120] X Q. 83. That is the trough that appears in photograph A of Defendants' Exhibit 17; isn't it?

A. That is the trough.

X Q. 84. When was this matter called to your attention for the purpose of testifying in this case?

A. I think it was Christmas Day, that would be Saturday afternoon.

X Q. 85. I suppose you had not given the matter much thought prior to that time?

A. Never had given it a thought.

X Q. 86. And you are depending on your memory and this photograph A for the precise details of construction; are you?

A. That is correct.

X Q. 87. Do you remember just exactly how the receiving end of the chute that you say was supported by a boom was arranged with relation to the delivery end of this wooden spout that appears in photograph A of Exhibit 17?

A. I cannot fully describe it. It is a 4 x 4 or a 6 x 6 and a lot of boards laid off on an angle; and this 6 x 6 was fastened on the edge of the car—I just forget how.

X Q. 88. You are not able to give any more detailed description than you have given of the precise manner in which the receiving end of this boom-supported chute was supported, are you?

A. No, sir, I couldn't.

X Q. 89. And this sketch, Exhibit 18, was made by you yesterday from memory, was it?

A. Yes, sir.

X Q. 90. But you are not sure of all the details, are you?

A. Only that I used on this trestle to pour concrete down into the coffer dam.

X Q. 91. When you arrived at the Gary location in November, [fol. 121] 1906, had this apparatus for distributing concrete been built?

A. It was built.

X Q. 91a. And was it in operation?

A. No, sir.

X Q. 92. Do you know who built it?

A. The carpenter boss that was on the job.

X Q. 93. Was that Mr. McCann?

A. That was Mr. McCann.

X Q. 94. Do you think he would be more likely to remember the exact details of construction of this apparatus than you would?

A. I think so.

X Q. 95. What time in November, 1906, was it?

A. I can't say exactly, but it was along the last of November. I can get the dates if necessary.

X Q. 96. Do you think it was about Thanksgiving time?

A. Thereabouts, I am pretty sure it was about the last part of November.

X Q. 97. How soon after your arrival did you see this apparatus in use for chuting concrete through the chutes?

A. A week or ten days, I should think.

X Q. 98. Now in this apparatus pictured in Photograph 967, which is Photograph B of Defendants' Exhibit 17, the mixer was of that type which had a pivoted snout, which was mounted in the open end of the revolving drum, and this snout was swung so that its outer end pointed upwardly, and its inner end pointed downwardly, while the mixing was going on; is that right?

A. That is right.

X Q. 99. The rotatable mixing drum in that apparatus wasn't capable of being tilted, was it, to discharge its load, but instead the [fol. 122] load was discharged, after mixing had been accomplished, by swinging the snout downwardly, and this would swing the inner end of the snout up into position where it would catch the material carried upwardly by the rotation of the drum, and falling off the inside ribs of the drum into the inner end of the snout?

A. That is correct.

X Q. 100. So that the chute which was supported by the boom, and which you have marked in Defendants' Exhibit 17, Photograph B, had to be in line with this snout, so that when the outer end of the snout was swung down it discharged the mixed batch, the snout would lie in the receiving end of the chute?

A. That is correct.

X Q. 101. Then this chute, during delivery of concrete from the mixer, had to be in line with the snout, didn't it?

A. I don't remember.

X Q. 102. Now, in this photograph the inner or receiving end of the chute is quite close up to the mixer drum, isn't it?

A. Yes, sir.

X Q. 103. And the discharge spout sticks out from the drum about three or four feet, doesn't it?

A. That comes out about 18 inches beyond the mixer.

X Q. 104. What was the diameter of the mixing drum in that mixer?

A. I should judge about between four or five feet, I am not sure.

X Q. 105. Doesn't the discharge snout which is sticking out of the open end of this rotating drum in Photograph 3 appear to have an exposed length of somewhat more than half the diameter of the drum?

A. About 24 inches or 2 feet.

[fol. 123] X Q. 106. Now, in order to discharge the mixture, the delivery end of this snout will be swung down into the chute which was carried from the boom, wouldn't it?

A. Yes, sir.

Adjourned Dec. 30, 1920, to meet by agreement.

Chicago, February 3, 1921.

Parties met pursuant to adjournment. Present, as before.

ALEXANDER CAMERON, recalled for further examination, testifies as follows, in answer to questions by Mr. Jones:

Q. 107. I call your attention to three additional photographs, numbered, respectively, 85, 125, and 178, and will ask if you are familiar with the apparatus shown therein.

A. 85 shows a concrete mixer on trestle which we used in building coffer dam at the Gary, Ind., pumping station along in November or December, 1906. 125 is the same mixer used in building intake connecting to pumping station at Gary, Ind. 178 is the same mixer on the intake connecting to pumping station at Gary, Ind.

Q. 108. When did you first see these pictures?

A. This morning.

Q. 109. Please compare the apparatus of Photograph 178 with Photograph A of Defendants' Exhibit 17.

A. They are the same, only the chutes are not on Photograph A.

By Mr. Jones: The three photographs are marked Photographs K, L, and M, respectively, to be included as part of Defendants' Exhibit 17.

By Mr. Hood: Qs. 107, 108, and 109, and the three photographs marked K, L, and M are objected to on the ground that the subject-matter thereof has not been properly proven.

[fol. 124] Q. 110. How do you account for the fact that the apparatus of Photograph M does not appear to be the same in all respects as the apparatus of Photographs K and L?

By Mr. Hood: Objected to as leading.

A. They are the same mixers, but K—I am not clear that it has a boom on this particular exhibit.

Q. 111. Is a boom shown on Photograph L?

A. No, there is no boom shown.

Q. 112. How do you account for the absence of the boom?

A. As we moved this mixer from the west side of the pumping station around to the east side of the pumping station to start building intakes—concreting the intakes—and can't say if we had boom in place yet. That is about all I can say on it.

Q. 113. Where was the apparatus of Photograph K located with reference to the pumping station?

A. On the west side on trestle.

Q. 114. Where is the pumping station that you have referred to in Photograph L?

A. It is the building right opposite this (witness indicates stepped concrete wall).

Q. 115. Do you mean that the pumping station had been built at the time this picture was taken, presumably March 2, 1907, the date on the photograph?

A. The walls were all built up around the affair and practically completed.

Q. 116. About where would this concrete wall be in Photograph A, Exhibit 17?

A. West of trestle (witness indicates the building in the middle of the picture).

Q. 117. Where is that concrete wall with reference to the building?

A. On the east side, it is the near side of the wall.

[fol. 125] Q. 118. Then, how do you account for the fact that you don't see the roof of the building in Photograph L?

A. Because this structural iron had not been put up yet, as we had nothing to do with it. That was erected by the American Bridge Company.

Q. 119. Then, as I understand your answer to Q. 115, you do not mean that the pumping station had been completed when this picture was taken, but merely that the concrete foundation walls had been completed; is that correct?

A. That is correct.

Q. 120. You have previously testified that your sketch, Exhibit 18, including a boom, shows the apparatus used in November, 1906, on the coffer dam at Gary; what have you to say with reference to that apparatus as compared with the apparatus in Photographs K and L, Exhibit 17?

A. I might have made a mistake on this; it is a long while to remember, but I knew I had a boom and an apparatus like Exhibit 18 on the work.

Direct examination closed.

Cross-examination by Mr. Hood:

X Q. 121. You are not sure that the mixer and chuting apparatus that you used in Gary in the fall or winter of 1906 in delivering the freshly mixed concrete to the coffer dam forms had a boom?

A. I am not clear on it.

X Q. 122. This Photograph K, which is a part of Defendants' Exhibit 17, pretty clearly indicates that there wasn't any boom on the apparatus on December 31, 1906, doesn't it?

A. Well, I can't answer that, because I don't see any there, I am not clear on it.

X Q. 123. This Photograph K shows the wooden trough or [fol. 126] spout about which you testified and which is shown in Photograph A, doesn't it?

A. Yes, that is the same trough. (Witness points to the wooden trough which lies between the two men in the upper left-hand corner of Photograph K.)

X Q. 124. In Photograph K, the upper or receiving end of the first metal chute has a chain bridle attached to it, hasn't it?

A. It looks like it, but I can't remember just how we had it fastened at that time.

X Q. 125. Even with these photographs before you, you find that you are not able to remember accurately the details of construction of that apparatus; that is right, isn't it?

A. I know that with those apparatuses we poured in a lot of concrete.

X Q. 126. Do you think that is an answer to my last question, Mr. Cameron?

A. I think that would be an appropriate answer.

X Q. 127. What has the fact of pouring an awful lot of concrete to do in answering my question as to whether or not you were able to remember the exact details of construction of this apparatus?

A. I didn't just quite study your question.

X Q. 128. I will ask you the question again. Even with these photographs A, K, L, and M before you, you find that you are not able to remember accurately the details of the construction of the apparatus which you say you used in delivering concrete to the forms for the coffer dam at Gary in the latter part of 1906; that is correct isn't it?

A. I can't remember the details.

X Q. 129. Referring to Photograph K, don't you think that this photograph indicates that the cable which passes through the block [fol. 127] is hooked into the chain bridle, the ends of which are hooked into eyes at the upper end of the first metal trough section, was connected to the house frame around the mixer, rather than being connected to a boom?

A. I can't remember.

X Q. 130. Was the first boom that you put on this apparatus the same boom that is shown in Photograph A?

A. Yes, sir, the same boom.

X Q. 131. Now, in Photograph A there seems to be two booms connected to the car which carries the mixer. Which one of these two was the first you put on?

A. As I remember it, we had to put the two on at the same time, one to carry the bell-mouthed wooden chute and one to carry the chutes; that is the best of my recollection.

X Q. 132. After you put these two booms on, did you use the apparatus without the booms?

A. No, after we once put them on we used them all along on the intake.

X Q. 133. Well, now, isn't it a fact that if there had been any booms on the apparatus on December 31, 1906, the lower ends of those booms would have shown in this Photograph K?

A. Yes, and I am in doubt whether they were on on this particular work or not.

X Q. 134. You intended in your sketch, Exhibit 18, to illustrate by the part marked 10 the upright arm in Photograph A, which is braced crosswise by the two inclined braces; is that right?

A. Yes, sir.

X Q. 135. There is nothing on this sketch, Exhibit 18, which corresponds to the little boom which we find in Photograph A, is there?

A. This little sketch is something I just drew up from remember- [fol. 128] ing back and recalling to my mind to the best of advantage what the mixer looked like. The sketch hasn't the little boom.

X Q. 136. The apparatus, as shown in Photograph K, is one in which the upper or receiving end of the first metal chute was tied back by the chain bridle and the cable to the mixer house, and the lower end of the first chute section was supported on the coffer dam bracing; that is right, isn't it?

A. That is right.

X Q. 137. In Photograph A the little boom attached to the mixer house frame wasn't capable of swinging from side to side, was it?

A. The little one was not.

X Q. 138. And in operation it was not swung up and down either, was it?

A. No, sir.

X Q. 139. What is your recollection of the use to which this little boom was placed—what was it for?

A. To hold up the mouth of this bell-mouth chute that we had connected on the mixer.

X Q. 140. You mean that heavy wooden trough or snout that is shown on Photograph A projecting out toward the observer?

A. Yes.

X Q. 141. That is the same wooden snout that we find in the upper left-hand corner of Photograph K between the legs of the two men?

A. As near as I can remember, it is.

X Q. 142. And it is your recollection, is it, that this little fixed boom, which I find in Photograph A, was used to support the outer end of that wooden trough?

A. To carry it from a tackle from the end of the boom to the front of the snout.

X Q. 143. You don't recall that this little boom was used for any other purpose, do you?

[fol. 129] A. No other purpose.

X Q. 144. Do you think that your recollection as to this detail is as accurate as it is on any other detail that you have testified about, do you?

A. I would say it was.

X Q. 145. The first metal chute section was suspended in some way from the larger of the two booms mounted on the mixer car in photograph A; is that right?

A. I can't recall how that was fastened.

X Q. 146. You don't recall just how the metal chute sections were supported, do you?

A. I know when this little boom was built, it was built to carry this bell-mouthed chute, and block and tackle was so arranged as to carry it.

X Q. 147. By "bell-mouthed chute," you mean the wooden trough that was placed to receive the discharge from tthe mixer and extended out at right angles from the mixer car?

A. Yes, sir.

X Q. 148. And that bell-mouthed chute was supported on the trestle work along side of the car?

A. Not on Exhibit A, but on this it is correct. (Witness points to photograph K.)

X Q. 149. Well, in photograph A I understand that the "bell-mouthed chute" is in an abnormal position for transportation and not in position to be used to receive concrete; is that right?

A. That is right.

X Q. 150. When the metal chutes in this apparatus were placed at an angle to the delivery line of the "bell-mouthed chute" those metal chutes were supported on horses or trestles, the cross bracing of the forms, weren't they?

A. In the coffer dam they were supported on the bracing and tied up with lines, wherever the occasion called for taking off a chute or putting it on.

[fol. 130] X Q. 151. When was the coffer dam completed?

A. The concrete work, to the best of my knowledge, along in March or April, I am not sure, but along in the spring of 1907, I can't say just when.

X Q. 152. When you moved a mixer car from the coffer dam site to the track alongside of the intake track, did they take the booms off the mixer car?

A. I can't remember.

X Q. 153. The fact is you are not at all sure that the booms were put on to the mixer car before the coffer dam was completed, are you?

A. I am not sure.

X Q. 154. There would be no reason to take these booms off in shifting the car from the coffer dam site to a position alongside the intake trench, would there?

A. It would be necessary to take off the bell-mouth chute or anything projecting on either side of the car that would interfere with running it along on the standard gauge railroad track, so that it would clear any railroad switch stands or anything that would be close to the tracks.

X Q. 155. At the time you put on the longer boom on the mixer car, you provided at the same time the upwardly projecting braced post, which I find in Photograph A and to which the boom block and tackle is attached; that is right, isn't it?

A. As I remember, we built the boom and mast and rigged up everything as you see it in Photograph A at the one time.

X Q. 156. You didn't take the mast down in order to run the mixer car from the coffer dam side to the intake side, did you?

A. No, there would be no occasion to.

X Q. 157. You don't find that mast in Photograph L, do you?

A. No, sir.

[fol. 131] X Q. 158. The mixer car in photograph L is right alongside the beginning of the intake, isn't it?

A. That is right.

X Q. 159. It is pretty certain, then, that there was no provision for any booms on the mixer car at the time the mixer car was brought to the position shown in Photograph L, isn't it?

A. It would look that way to me.

X Q. 160. Now, when you got to the position alongside of the intake line with your mixer and had occasion to swing the metal chutes to one side or the other, you found it necessary to support the lower end of the metal chute on some sort of a thick support, either a trestle or a part of the intake forms, or some of the bracing for the trench, in order to hold it in place, didn't you?

A. That answers to Exhibit K, and to Exhibit L, and we found it such hard work that we devised some other scheme, hence the boom.

X Q. 161. And after you got the booms in place, you still found it necessary when you swung the metal trough out of line of the wooden bell-mouthed chute to support the lower end of the metal trough on a trestle or to tie it to the bracing or intake forms, in order to hold it sidewise, didn't you?

A. Not necessarily, we could hold it with a guy line and carry it on our own boom.

X Q. 162. You stated the other day that this apparatus for distributing concrete had been built before you arrived at the location in November, 1906. I understand now that you are not at all sure that the booms were on the mixer car when you got there in November?

A. I am not at all sure.

X Q. 163. The fact is that if the booms have been on the mixer [fol. 132] car before March 2, 1907, the date of this Photograph

L, the mast for the big boom would show in the Photograph L, wouldn't it?

A. It would.

X Q. 164. And the fact that this Photograph L does not show a mast is pretty conclusive that the booms were not on the mixer car until after March 7, 1907; isn't that right?

A. It would look that way to me.

X Q. 165. Are you able to tell, either from memory or from Photograph K, how the upper end of the first metal chute was supported?

A. I can't recall now just how it was fastened, but it was so arranged that you could pick it up and carry it round to any particular point that we wanted to place concrete.

X Q. 166. At about how much of an angle did you find that you could swing this first metal chute?

A. We worked concrete about 30 feet sections at a time, and we would place chutes for concrete in any part of the sections.

X Q. 167. And when you completed one 30 ft. section, you would then move the mixer car to a new position about 30 ft. away?

A. Yes, sir.

X Q. 168. About how long were the metal chute sections?

A. About 14 or 16 feet to the best of my knowledge, so that four men could pick them up and carry them around easily.

X Q. 169. When you were pouring the concrete for the intake line, you found it necessary to tie two of these sections together, in order to make a chute long enough to get from the delivery end of the wooden bell-mouthed chute down to the intake forms, didn't you?

A. Yes, sir.

[fol. 133] X Q. 170. And you did that by nesting one chute in the other, overlapping them somewhat and tying them together?

A. Only seeing on the pictures, I can't recall how we got them there. They were connected together, and when we got down into the forms we ran chutes along on the side of the intake and would fill that side up to a certain height; then we moved to the other side of the intake, arranged our chutes, and poured our concrete to a regular height.

X Q. 171. In order to reach the extreme end of one of these 30 ft. sections of the intake, did you use one or two sections of the metal chute extending along parallel with the intake line?

A. When you get the 30 ft. section, that was in the pumping station.

X Q. 172. How long a section of the intake line did you pour with the mixer car standing in one place?

A. Our first sections, starting from the pumping station, were 125 ft.

X Q. 173. Do you mean that you poured this 125 ft. of intake line without moving the mixer car?

A. Setting up in the middle of that section we poured both ways.

X Q. 174. Well, you poured some of the first part of the intake line through a chute that extended straight out from the mixer car down

into the intake form, without any boom support for the chute, and that is shown in Photograph L, isn't it?

A. Yes.

Adjourned to Friday afternoon, Feb. 4, 1921.

Cross-examination by Mr. Hood continued:

X Q. 175. Referring to Defendants' Exhibit Photograph B of Exhibit 17, do you recall just what sort of a connection there was be-
[fol. 134] tween the mixer and the inner end of the chute carried by the boom?

A. It is so long ago that I cannot go ahead and tell you clearly what kind of a connection we had. We had some kind of a connection which I cannot describe just now to answer in placing concrete in one 30 ft. section of dock.

X Q. 176. Did you do all that placing with one chute that was carried by the boom, or did you use supplemental sections?

A. We had connected on this particular chute what you would call a kind of counterbalance. We would dump into the chute and we would chute into either ends of this form.

X Q. 177. That counterbalance that you have just referred to is not shown in Photograph Exhibit B, is it?

A. No, that is where we were on the concreting in the dock.

X Q. 178. The Photograph B shows the apparatus in the same condition, so far as the mixer and boom-supported chute are concerned, that it was the first time you used it in April or May, 1908, doesn't it?

A. Yes, that looks like the same chute, or the same kind of a chute that we put on when we built that rig to pour the concrete in that dock.

X Q. 179. As I understand it, you were continuously familiar with and working with the various concrete chuting devices about which you have testified, from November, 1906, and thereafter, until the date of the last produced apparatus about which you have testified in your direct examination; is that right?

A. Yes, sir, being in charge of the work and being there all the time I was very familiar with it.

X Q. 180. And you were constantly endeavoring to improve their operation, so as to make them more efficient?

[fol. 135] A. As conditions would come about—in different places under different conditions—we arranged to suit the different places.

X Q. 181. And on all these jobs you had constantly in mind a desire and effort to improve their construction and operation so as to increase their efficiency?

A. Yes, sir.

X Q. 182. And you exercised your best endeavors in that respect?

A. Yes, sir. I devoted all my attention to it, and worried considerably figuring out schemes.

Cross-examination closed.

Redirect examination by Mr. Jones:

R. D. Q. 183. Do you know Mr. A. C. Paterson, the photographer?
A. Yes, sir.
R. D. Q. 184. Did you see him taking any photographs at Gary?
A. Yes, sir.
R. D. Q. 185. About when?
A. The latter part of 1906, and the winter and summer of 1907.
R. D. Q. 186. You were asked in X Q. 138 regarding the manner of supporting the bell-mouth chute, and you answered with reference to Photographs A and K, of Exhibit 17; how is it supported in Photograph M?
A. It is supported by an A-frame.
R. D. Q. 187. About how many sections of chute did you use at the most with that apparatus?
A. Our chutes were about fourteen to sixteen feet, as I remember; the height we were setting up on the bank from the work was probably twenty feet, and we had enough sections to lead concrete down into our intakes—that would be about two or three sections, as near as I can recollect, to lead it down.

[fol. 136] By Mr. Hood: Attention is called to the fact that all this has already been inquired agout in the direct examination of this witness.

R. D. Q. 188. I was not inquiring as to the number shown in that figure, but as to what was the greatest number that you ever used at one time?
A. Three or four, I would say.
R. D. Q. 189. In this photograph the first two sections are fastened together to make a single length or section. In your previous answer did you consider this as one or two lengths?
A. I would consider that as two lengths.
R. D. Q. 190. You have explained that the metal chutes of this apparatus were supported on horses, trestles, and cross-bracing when used in the coffer dam. How were they supported when used on the intake trench work?

By Mr. Hood: Objected to as already answered.

A. Part was carried by a boom to hold them up, and the fact that we had—on the intake would be load supported by bracing and leading off along the side of the intake.
R. D. Q. 191. What is the purpose of the rope which is hanging loosely from the end of the boom in Photograph M?
A. Swinging around to concrete on either end of section of intake.
R. D. Q. 192. What do you mean by "swinging around to concrete"?
A. Swinging round chute to either end of section of intake.
R. D. Q. 193. How did this rope swing the chute?
A. We raised our chute with tackle and swung it around and tied it and led it into our chute at either end of section.

[fol. 137] R. D. Q. 194. Can you describe a little more in detail what you did with this rope hanging loosely from the end of the boom, which resulted in swinging the boom?

A. The man pulled the boom and chute around to any particular place in this section that we wanted to concrete.

R. D. Q. 195. As I understand you, you mean the man pulled the rope which swung the boom which carried the chute; is that correct?

A. That is correct.

R. D. Q. 196. Do you appear anywhere in the catalogue, Exhibit 19?

A. Yes, sir, on page 78.

R. D. Q. 197. How much of the apparatus of Photograph M did you use in your first work on the coffer dam?

A. The new parts that I see here would be the boom, the A-frame, the mast, and the necessary tackles to hold up those particular parts.

R. D. Q. 198. In Photograph B of this same exhibit, what arrangement, if any, was there to prevent concrete discharging from the snout of the mixer from over-chuting the upper end of the chute when the latter was not exactly in line with the mixer outlet?

A. Standing at one side of that mixer there must be a man who regulates the dumping of that with a lever to let it out as slow as you want or as fast as you want.

R. D. Q. 199. When the chute was turned sidewise, would the concrete slide from the snout into the chute?

A. Not that I ever noticed, or if it would we would soon put a stop to it.

R. D. Q. 200. You must have misunderstood my question, as you have previously testified that the purpose of this chute was to make the concrete run down it.

[fol. 138] A. The lower chute—I understood the second chute which was hanging on the end of the first chute—a short chute.

R. D. Q. 201. Have you not testified that the chute marked "Chute" in Photograph B could be swung by a boom from side to side?

A. Yes, we could move that far enough to work a 30 ft. section of concrete, pouring a 30 ft. section at one time with the assistance of a counterbalance chute on this end leading to pour it at either side of the form or concrete dock (witness indicates with his finger and pencil a chute supported toward the middle of the chute).

R. D. Q. 202. Now, after this "chute" marked in the photograph had been swung to one side, as you have testified, and the snout lowered, would the snout discharge concrete into the chute or not?

A. I don't remember of it discharging any over the side of the chute.

R. D. Q. 203. Well, if it did not discharge over the side, where did it discharge?

A. Down the chute.

R. D. Q. 204. Then you misunderstood Q. 199, in stating that you would put a stop to it if it did discharge into the chute?

A. No, if it discharged over the side of the chute, that is the way I understood your question.

R. D. Q. 205. Describe a little more fully this counterbalanced chute you have been referring to, which you hung from the end of the main chute.

A. We took an ordinary piece of chute, 4 feet long, I would say, and we had a strap around the center of that chute leading to another fastening over the chute leading from the mixer, and when occasion called for it we dumped concrete on the back part of the [fol. 139] dock and, whenever we had occasion, poured on the front part of the dock, or to any part of the form that we had a mind to, just by the action of one man swinging this part.

R. D. Q. 206. And this was hung from one end of the main chute?

A. Yes, leading from the mixer.

R. D. Q. 207. Did you ever use an additional length of chute connected to this counterbalanced chute?

A. Not that I can recall in pouring a 30 ft. section in the dock, but in pouring a coffer dam setting right opposite the mixer in Photograph B.

R. D. Q. 208. Was this counterbalanced chute counterbalanced with anything other than its own weight?

A. No, sir.

Redirect examination closed.

Recross-examination by Mr. Hood:

R. X Q. 209. When did you first use the short four-foot counterbalanced extension of the apparatus shown in Photograph B?

A. In the latter part of April, 1907, as near as I can recall.

R. X Q. 210. In 1907 or 1908?

A. I was wrong on that—in 1908.

R. X Q. 211. You made that some time after you first put the apparatus shown in Photograph B into use in March or April, 1908, didn't you?

A. Yes, sir.

R. X Q. 212. You did not have that extension at the time you first put the apparatus into use, did you?

A. No, sir.

R. X Q. 213. During the operations at Gary in the fall of 1906 and during 1907 in connection with the blast furnace pump-[fol. 140] ing station and the water tunnels which were connected with it, photographs were taken by Mr. Paterson to show progress of the work there every few days, were they not?

A. As near as I can recall; and at that time it was about every two weeks, I think.

By Mr. Jones: Counsel for defendants objects to the form of the questions on cross-examination, most of which put the words into the witness' mouth, instead of asking for his recollection of the facts.

By Mr. Hood: The objection comes too late, even if it were tenable. The witness is a man of intelligence and well able to take care of himself.

Recross-examination closed.

Re-redirect examination by Jones:

R. D. Q. 214. You have previously testified that you made this apparatus of Photograph B in the latter part of 1907 or first part of 1908, and that it was used about the middle of April; what was it doing in the interval?

A. Lying in harbor; in the month of March we could not do anything—in the month of March we were building this rig and getting in shape to concrete.

R. D. Q. 215. What rig were you building in March?

A. Our men were working on different scows, and also working on this particular concrete mixer.

R. D. Q. 216. You mean, then, that you begin work on it the latter part of 1907, but did not complete it until March, 1908.

A. We commenced on that rig along in the fall of 1907. We had a very few men, and we kept them puttering around, and when it was bad weather we put them down in the hold of the scow, bracing up, strengthening, and reinforcing.

R. D. Q. 217. Then, the apparent delay, as I understand it, was [fol. 141] due to the small number of men and to the winter weather; is that correct?

By Mr. Hood: The question is objected to. Counsel for defendants can hardly complain relative to putting the words into witness' mouth.

By Mr. Jones: The witness has stated these facts, which are simply summarized in the question.

A. Yes, that is correct.

Deposition closed.
Signature waived.

Washington, D. C., January 14, 1921.

Met pursuant to agreement and subsequent notice.

Present: Cyrus N. Anderson, of Philadelphia, Pa., for plaintiffs; George Bayard Jones, of Chicago, for defendants.

Testimony taken before Francis S. Maguire, Notary Public, for the District of Columbia.

Arthur L. Smith, a witness produced on behalf of defendants, being first duly sworn, testifies as follows in answer to interrogatories by Mr. Jones:

Q. 1. Please state your name, age, residence and occupation.

A. Arthur L. Smith; sixty-eight; 931 M St., N. W., Washington, D. C.; builder and contractor, Arthur L. Smith & Co.

Q. 2. Are you the Arthur L. Smith to whom a patent was issued February 8, 1910, No. 948,746, assigned to Concrete Appliances Company, a copy of which patent I show you?

A. Yes, sir.

Q. 3. Were you subpœnaed to appear in this case?

A. Yes, sir.

[fol. 142] Q. 4. If you recall the circumstances surrounding the making of the invention, identified in this patent, please describe them.

A. I have had in mind the application of spouting materials of different characters since 1882, and at that time used it in the form of handling grain on the Missouri Pacific R. R. Grain Elevator, South St. Louis, Mo., in 1882 and 1883. Afterwards in the construction of reinforced concrete I applied the spouting system on the Lynnhaven Hotel at Norfolk, Va., in 1906.

Q. 5. Please describe the apparatus you used in 1906.

A. 1906, in erecting the Lynnhaven Hotel, we started to distribute the concrete from the hopper of the tower which was of general use throughout the country by means of wheelbarrows. It occurred to me at this time that concrete could be handled by means of spouting. This matter I had discussed on several occasions with architects and engineers and they were of the opinion that in spouting the concrete that the gravel or rock, whichever may be used in the composite, would separate from the sand and cement, but I proved on this work to my own satisfaction that concrete could be distributed successfully by means of spouting.

Q. 6. Have you a photograph of any of the apparatus used on the Lynnhaven Hotel?

A. I did have photographs of the skeleton of the building which I recognize as this being a copy of the same as I had these photographs taken and in so doing I gave the position by which I wanted the photographer to take the picture from.

By Mr. Jones: The notary is requested to mark the photograph Defendants' Exhibit 19′, Photograph of Lynnhaven Hotel.

It is stipulated that a reproduction may be used instead of the original photagraph.

[fol. 143] Q. 7. How long have you had this particular photograph?

A. Since the fall of 1906.

Q. 8. And you have had it in your possession all this time until you loaned it to me?

A. Yes, sir.

Q. 9. I call your attention to a carbon copy of a sketch, the original of which, together with a reproduction of the photograph Exhibit 19, was filed in court last August in connection with a preliminary injunction motion in this suit, and will ask if this sketch is a fair representation of the main features of the apparatus you have just referred to.

A. Yes, sir.

The notary is asked to mark this sketch Defendants' Exhibit No. 20, Smith Sketch of Lynnhaven Hotel Apparatus.

Q. 10. Describe briefly this apparatus using the numbers on this sketch.

A. No. 1 is the tower; No. 2 is the bucket in which they hoist the concrete; No. 3 is a hopper which the concrete is dumped into; No. 4 would be a spout connected with the hopper; No. 5 is an additional extension spout; No. 6 would be an indication of a rearrangement of the spouting (referring to the dotted lines 6 and 7); 8 and 9 would be horses or trestles by which the spouts were supported and to be used movable to any position as may be desired; 10 would be a block and tackle by which we lifted the end of spout No. 1 to any position that we saw fit in spouting concrete.

Q. 11. You have stated that these various parts "would be," do you mean that they were actually in use as you have described them?

A. Yes.

Q. 12. How was the upper spout 4 connected to the hopper 3 so [fol. 144] that it would be lifted by the block and tackle?

A. That was secured to the hopper and made flexible by means of hooks.

Q. 13. What was the result of this flexibility?

A. For the purpose of raising or lowering the spout or for removing it.

Q. 14. Could this spout be moved only up and down?

A. No, it could be swung around also.

Q. 15. To about how much of an angle could it be swung?

A. At right angles to the hopper.

Q. 16. Do you mean by this at right angles on both sides or practically half a circle?

A. Describing half a circle.

Q. 17. Please trace the progress of the concrete from the time it is mixed to the time it reaches the forms, referring to the sketch.

A. The concrete in the first place is deposited in the mixer at the bottom of the tower, then discharged into a bucket within the tower, known as a dump bucket. The dump bucket carries the concrete, which is attached to a cable to the hopper in which the concrete is dumped and from there spouted to the position, as may be required.

Q. 18. When you wish to change the point at which the concrete is being deposited, what would you do?

A. We moved the spouts to various locations.

Q. 19. How did you move the upper spout?

A. By means of a block and tackle.

Q. 20. You mean by this that it was supported by a block and tackle while you swung it around?

A. Yes, sir.

Q. 21. How did you move the lower section of spout?

A. We had to move that with common labor. We picked up the horses and spouts and placed them in position as was required.

[fol. 145] Q. 22. How many sections of spout did you use?

A. It depended entirely on the distance we were spouting the concrete. Sometimes one, two or three, as may be required for the distance.

Q. 23. Were these two or three sections always arranged in a straight line?

A. Not always.

Q. 24. Were they ever arranged about as shown in the lower half of the sketch, Exhibit 20?

A. Yes, sir.

Q. 25. In other words, these chutes could be made to cover practically the entire area represented by the combined length of the chutes, is that it?

A. Yes.

Q. 26. How were the chutes made?

A. Just made of wooden spouting; they were rectangular because they were broader on the bottom than on the sides.

Q. 27. Were they open or closed spouts?

A. Open.

Q. 28. How do you fix the year 1906 for this work?

A. The building was being erected for the Jamestown Fair and was to be used as a hotel.

The notary is requested to note on the record that the sign in the photograph Exhibit 19′ reads, "The Lynnhaven Modern Fireproof Hotel 200 Rooms 75 private baths, opens April 1, 1907."

Q. 29. Is any part of your apparatus shown in this photograph?

A. The head of the tower including the hopper and the frame of the tower from the ground up is all that is shown in this photograph.

Q. 30. Please refer to the hopper by some letter or figure.

[fol. 146] A. No. 2 would indicate the hopper and 3 the spout from the hopper.

Q. 31. What is the tower B and the tower in front of it?

A. The tower B was a brick hoist; tower A was used for conveying the concrete from the mixer at the ground level to the hopper.

Q. 32. On about how many floors were your apparatus used?

A. Probably about three floors. I think it was from the fourth to the seventh floors.

Q. 33. And was the apparatus successful?

A. Yes, sir.

Q. 34. What was used on the lower floors to distribute concrete?

A. Wheelbarrows.

Q. 35. What was the apparatus commonly used on other buildings about this time?

A. The concrete was mixed and carried up in buckets and deposited in the hopper and discharged from the hopper into wheelbarrows and there distributed on the work.

Q. 36. I call your attention to a Ransome Concrete Machinery Co. catalogue having the date 1906 on page 2, and will ask you if

you are familiar with the apparatus illustrated in the [illegible] cut facing page 42.

A. Yes, sir. It is a tower with a Ransome mixer and automatic dump bucket for the purpose of conveying the concrete to different elevations by means of a dump bucket to a hopper with a gate attachment for the purpose of loading wheelbarrows or whatever use it might be put to. This tower was used to quite an extent throughout the country at the time I conceived the idea of spouting.

Q. 37. In such cases what was done as the building became higher?

[fol. 147] A. The hopper was lifted to the several elevations as may be required for the distribution of the concrete, for example, the hopper was generally lifted from one story to another as the work progressed.

Q. 38. Was the tower of fixed height?

A. As a general thing, it was.

Q. 39. You mean to imply that there were some cases where the tower became higher as the building became higher?

A. Yes; it depends on the conditions, as the greater the height of the building sometimes we found it an advantage to carry the tower up part way and secure it to the building and then continue it up to greater height.

Q. 40. What was your practice with reference to the height of the hopper and tower in using your apparatus on the Lynnhaven Hotel?

A. We did this in this case of extending the tower after running a certain height in the building.

Q. 41. You mean you raised both the tower and the hopper as the work progressed?

A. Yes, sir.

Q. 42. What did you do with the block and tackle in such cases?

A. We raised that accordingly.

Q. 43. Your patent 948,746 shows and refers to a boom 15 at the top of the tower. About when did you conceive the combination of a boom for supporting a chute or pipe in conjunction with a concrete hoisting tower with a vertically adjustable hopper on it?

A. The boom was always a part of my thought in handling the spouting, but was never applied until I erected a tower and spouting combined used in St. Louis on the Coliseum.

Q. 44. At the time you built the Lynnhaven Hotel, had you ever seen booms used for any purpose?

[fol. 148] A. I had used them for many years for all different purposes, as they were commonly used for hoisting materials of all kinds, as well as spouts. The particular boom which I used on the St. Louis Coliseum I found more applicable for that particular job.

Q. 45. What can you say about the consistency of the concrete used on this Lynnhaven Hoted job?

A. I found it necessary to make the concrete more of a liquid form by means of spouting than by means of handling by wheelbarrow.

The notary is requested to mark the Ransome catalogue Defendants' Exhibit 21, Ransome Concrete Machinery Company 1906 Catalogue.

Q. 46. At the time of this work, had you ever applied for a patent?
A. I never had.
Q. 47. Who is E. Tatterson, whose name appears on the photograph, Exhibit 19?
A. He was the contractor of the Lynnhaven Hotel that employed me as his superintendent for the construction of this work.
Q. 48. Is he living?
A. No, sir.
Q. 49. Do you know T. A. Tatterson?
A. Yes, sir, he is the son of the deceased.
Q. 50. Did he have anything to do with this building?
A. He was my timekeeper on this job.
Q. 51. Do you know R. B. Preston, of Portsmouth, Va.?
A. He was the superintendent for the architects of this particular job.
Q. 52. Do you know Andrew J. Kerns who made an affidavit the 23rd of August, 1920, with reference to this Lynnhaven Hotel job? [fol. 149] A. Yes, sir, I know him. He was employed during the first part of the work as an engineer.
Q. 53. What became of him later?
A. He was removed from the works, by the order of Mr. Tatterson.
Q. 54. I call your attention briefly to affidavits of J. S. Goldback, Roland Brinkley, W. T. Baker and W. N. Thornton, filed in court last summer or fall, stating in substance that the apparatus you describe was not used on this building. Can you account for their impressions in any way?
A. Mr. Brinkley was the bookkeeper of Mr. Tatterson and was located at all times in the general office of Mr. Tatterson and had nothing to do with the building and knew nothing of its construction and I don't ever remember seeing him on the work. Mr. Baker was a superintendent for Mr. Tatterson on the Fairfax Hotel and the Paul Greenwood Buildings during the time that I was erecting the Lynnhaven Hotel and had nothing to do with the reinforced concrete construction of the Lynnhaven Hotel, as I was employed by Mr. Tatterson in Washington to go to Norfolk and take full charge of this work, and to my certain recollection Mr. Baker had so much on his hands that it was not possible, neither was he supposed to have had anything to do with the Lynnhaven Hotel. I never remember seeing him on the work during the construction of the reinforced concrete, but once or twice as I was in full control of this work and there was no occasion for Mr. Baker to visit this work. As to Mr. Goldback he or his men installed the electric conduits on this building and had nothing to do with the reinforced concrete and was not familiar with the manner in which I was handling the reinforced concrete. As to Walter Thornton, he was of the firm of plumbers that had the contract for the plumbing on the Lynnhaven Hotel and was not familiar [fol. 150] with the construction of reinforced concrete or the manner in which I was handling this work. I never at any time conversed with Mr. Baker, or Mr. Brinkley, or Mr. Goldback or Mr. Thornton as to the apparatus in which I was then studing out for a patent.
Q. 55. How much of this building frame was of reinforced concrete?

conveyed into a lower spout with a hopper. From this hopper the concrete was spouted from the lower spout into the wood forms required for the construction of the building.

Q. 79. Did the hopper remain always at the same point on the tower?

A. No, it was adjustable.

Q. 80. How was it adjusted?

A. It was worked by means of a slide and block and fall which raised it to whatever elevation we saw fit.

Q. 81. Can you produce any additional photograph of this apparatus?

A. This photograph I have here is the only one I have.

[fol. 154] The notary is asked to mark this photograph Defendants' Exhibit 22, Smith Photograph of St. Louis Coliseum Apparatus.

It is stipulated that a reproduction may be used in place of the original.

Q. 82. How long have you had this picture?

A. Since the date shown on the photograph, August 27, 1908.

Q. 83. You mean you have had this in your files ever since?

A. Yes, sir.

Q. 84. Who is Eugene Taylor, whose name appears on the picture?

A. He is the photographer whom I employed.

Q. 85. How was your proposal to use this apparatus treated by the men on the work?

A. It was condemned generally.

Q. 86. How did it work after it was put into operation?

A. It was a complete success. I want to say that it was condemned generally by the labor organizations, as they saw it was a labor-saving proposition.

Q. 87. About how much of the concrete on the job was poured with your apparatus?

A. I would say 95 per cent.

Q. 88. What can you say with reference to the cost of the work and the time required?

A. It was a great saving in cost of labor and I would say material to some extent. I found the mixing of concrete by the spouting system there was a saving of material labor over that of handling it by hand, as there was no waste of material. It was a great advantage on the speeding up of the work generally as under this system you could handle concrete in one-half of the length of time that you would by any other system.

[fol. 155] Q. 89. An affidavit was filed in court last summer by one John S. Bronson of St. Louis, in which he quoted some prior testimony of his given when he was a witness on behalf of William H. Insley of Indianapolis in a Canadian patent suit entitled Concrete Appliances Company v. Rourke, 3287—1913, in which Bronson refers to certain concrete spouting work in St. Louis. Do you know this party?

A. Yes, sir. He was an agent for the Ransome concrete mixer, and we bought one or two mixers from him; one was used on this job. Other than that he had no experience in reinforced concrete and had nothing to do with the construction of the tower or concrete apparatus or the building, but asked my permission to rig himself out with overalls and jumper and work in among the men to try to gain experience.

Q. 90. Was the concrete used on the Coliseum of the same or different consistency from that used on the Lynnhaven Hotel?

A. The same, with the exception that where wheelbarrows were used on the Lynnhaven we spaded the concrete in order to get it into the forms and in and around the reinforced steel as we did not handle it with as much liquid from wheelbarrows as from the spouting. We found that we could not use concrete in wheelbarrows with the same amount of liquid as we could by means of spouting.

Q. 91. What effect, if any, did the use of steel bars in the concrete have on the amount of water used in the mixture?

A. It had a tendency to stop the flow—you could not get as homogeneous a mass with a drier concrete as a more liquid form. A liquid concrete finds its way in among the steel whereas a drier consistency would not.

Q. 92. Are there more reinforced concrete buildings built today [fol. 156] than the period you have referred to—1906-1908?

A. A very large percentage more, as it is more economical than the structural steel.

Q. 93. I call your attention to a carbon copy of your preliminary statement, a certified copy of the original of which was filed in court last summer, and will ask you to glance it over and state where you were during the progress of the interference referred to therein No. 30,533?

A. I was in the Philippine Islands.

Q. 94. Did you personally supervise the prosecution of your application and the interference or was it left to your attorney?

A. It was left to my attorney.

Q. 95. Do you recall what your attorney did to terminate the interference?

A. No, I do not. He got out the patents.

Q. 96. This interference involved two parties—Emtman and Callahan—besides yourself. Do you recall how the interference terminated as between these three parties?

A. I won it.

Q. 97. Did your attorney investigate any of your early work in this connection?

Objected to because apparently witness has no personal knowledge of what his attorney did.

A. He came on to Washington to see me in reference to it to get all the data and I gave him all the data. He afterwards told me he went to Norfolk and got all the data in order to lay claims for the patent.

By Mr. Anderson: Objection made to that portion of the answer which states what his attorney told him as being hearsay.

Adjourned until 1:30 p. m.

[fol. 157] Met pursuant to adjournment.

Present, same as before.

Q. 98. You have stated that you had a boom in mind at least as early as the date of the Norfolk job, in 1906. How was this boom to be mounted on the tower as you had it in mind at that time?

By Mr. Anderson: Question objected to as not calling for an actual construction but for an imaginary one.

A. On the corner of the tower in order to swing and manipulate the spouting.

Q. 99. How would the boom be arranged, i. e, how would it point?

A. It would point outwardly from the tower.

Q. 100. You mean horizontally or in an inclined position?

A. On an incline.

Q. 101. Had you seen booms mounted in this way before this date?

A. Many of them.

Q. 102. In view of this earlier conception, why did you mount the boom on the tower on the Coliseum job horizontally?

A. It was more applicable for the job.

Q. 103. In your original conception referred to was the boom to be fixed at its lower end or adjustable?

A. Fixed at the lower end and made adjustable to raise to different heights.

Q. 104. In your preliminary statement you stated that you made sketches of your device in July, 1906; have you any of these sketches left?

A. No, sir.

Q. 105. You also stated that you first explained the invention to [fol. 158] others in July, 1906. Do you recall any of the parties or circumstances relating to this disclosure?

A. No, sir.

Q. 106. You stated that the Lynnhaven Hotel apparatus included an upper spout secured to the hopper by means of hooks. Can you explain this arrangement a little more fully?

A. Well, there was a swivel proposition on the bottom of the hopper and then the spout was hooked to that swivel. It was necessary to have a swivel in order to swing the spout.

Q. 107. Referring to the photograph of Lynnhaven Hotel, Exhibit 19, was the block and tackle used in pouring the highest floor or roof, whichever you call it?

A. No.

Q. 108. Was it used on the next to the top floor?

A. I answered that question some time ago; it was used from the fourth to the seventh to the best of my recollection.

Q. 109. Why was it not used on the last one or two floors?

A. I did not need it. I had all the information I wanted up to that time.

Q. 110. On what specific apparatus are your patent drawings based?

A. Upon the—from its first conception.

Q. 111. I was referring more particularly to the actual drawings and not the claims.

A. The Coliseum Building.

Q. 112. I note that the boom is described in the patent but is not included in the claims. Do you recall why this is?

A. An oversight on the part of my attorney.

Q. 113. At the time you executed this application, had you any previous experience with patents?

[fol. 159] A. No, sir. This was the first patent I ever took out.

Q. 114. How do you distribute concrete in your work today?

A. It depends entirely on the character of the building. A large building we find it more profitable to use the spouting system. A small building we use an ordinary way of taking the concrete up by wheelbarrow and brick hoist.

Q. 115. Do you ever use carts filled from a hopper on a tower?

A. We do. In some cases, in some cases a wheelbarrow.

Q. 116. In your photograph Exhibit 22, the lower end of the first section of spout appears to be supported on some kind of a frame; how long was this support used?

A. That was only temporary.

Q. 117. Were the Coliseum chutes closed pipes or open spouts?

A. Open spouts.

Q. 118. Have you ever met Messrs. Emtman and Callahan involved in the interference?

A. No.

Direct examination closed.

Cross-examination by Mr. Anderson:

X Q. 119. What time in the year 1906 was the concrete distributing apparatus which you say you used in the construction of the Lynnhaven Hotel at Norfolk, Va., completed and put into use?

A. In the fall of the year.

X Q. 120. Would you say September, October or November, 1906?

A. I don't remember.

X Q. 121. Would you say it was prior to December, 1906?

[fol. 160] A. Yes.

X Q. 122. In the sketch, Exhibit No. 20, you show two spouts or troughs, designated respectively 4 and 5. What is your recollection as to whether a greater number of troughs were used in this work?

A. Not to exceed three spouts.

X Q. 123. Is it your recollection that you actually did use three?

A. In some cases I did.

X Q. 124. You mean in some cases on the Lynnhaven Hotel?

A. Yes, sir.

X Q. 125. You did not say anything about that, however, in the affidavit which you have previously given in this case and which was executed by you August 6, 1920, did you?

(Witness reads affidavit.)

A. Probably did not.

X Q. 126. Will you please indicate by the letter X the top floor of the Lynnhaven Hotel Building as shown in the photograph, Defendants' Exhibit 19?

A. I have done so.

X Q. 127. I have indicated what appears to be another floor as shown in this photograph by the letter Y. Will you please tell me what that is?

A. That is the roof slab.

X Q. 128. I notice that what appear to be columns which I have indicated by the reference letter Z extend a considerable distance above the part which you have said is the roof designated Y. Why are these parts extended so high above the part marked Y?

A. They were built for the support of the cornice which was a very heavy projection of terra cotta and also for the support of the parapet walls.

A. Our first sections, starting from the pumping station, were 125 [fol. 161] X Q. 129. What is the part which I have marked Y' on this photograph Exhibit No. 19'?

A. That is a part of the form work which encloses a line of girders, which is a part of the construction for the support of the terra cotta cornice.

X Q. 130. Do I understand that this spouting system of yours was employed in the distribution of the concrete on the top floor X?

A. No, it was not.

X Q. 131. Then this photograph does not show any part of any such spouting apparatus, does it?

A. I think it does.

X Q. 132. How could it in view of the fact that the photograph not only shows the top floor X, but also shows the roof Y and in view of the further fact that you have stated that the spouting was not used in the distribution of the concrete on the top floor X?

A. It was used on these floors from this part down (witness indicates the floor below X), but not on the upper floor, as it did not have fall enough to do any good.

X Q. 133. Well now, notwithstanding the fact that you did not use the spouting system in the distribution of the concrete on floor X, but last used it on the floor W, did you keep the falls or spouts in place all the time that you were laying the concrete on floor X?

A. No, sir; only the head of—just at the head or top—the mouthpiece of the hopper.

X Q. 134. By "mouthpiece" of the hopper you mean the part thereof which appears to be closed by the part marked "Bin Gate" of the cut of Exhibit 21, opposite page 42?

A. I do not. There was an attachment as a swivel outside of the hopper. A short piece of a spout. That was to attach the other spout.

[fol. 162] X Q. 135. Please take Exhibit No. 20 and indicate thereon the "mouthpiece" to which you refer.

A. As this is only a crude sketch, it is not indicated clearly how it was constructed.

X Q. 136. Well now, in addition to the trough 4, in the Lynnhaven Hotel construction, was there a supplemental short trough intermediate the trough 4 and the hopper 3?

A. A swivel attachment as you might call it, a short spout which is not indicated here clearly.

X Q. 137. You have described in two or three different places, first in your affidavit executed Aug. 6, 1920, and again today in your testimony, the manner of connection between the upper end of the trough 4 and the hopper 3. In your affidavit of Aug. 6, 1920, you state that the chute 4 was secured to the hopper at one end by a swivel bolt 6"; today for the first time you refer to the use of hooks combined in some way or other with a swivel, but not until a moment ago have you referred to an additional short spout or anything like it. Now, as a matter of fact, do you really remember how the connection was made, assuming that you did use spouts, between the upper end of the spout or chute 4 and the hopper 3?

A. I explained to you a few minutes ago that there was a swivel spout proposition on that and that explains the situation as far as I can see.

X Q. 138. Then the showing of the connection of the upper end of the chute 4 and the hopper No. 3 upon Defendants' No. 20 is incorrect, is it not?

A. I will say in reply to that that this sketch is only a crude drawing and it is not brought out in detail.

X Q. 139. Why was it that you did not mention this short swivel spout that you have just referred to under cross-examination at any previous time?

[fol. 163] A. I don't think it was ever asked of me to go into details minutely.

X Q. 140. But you were asked, were you not, to explain how the upper end of the chute 4 was connected to the hopper 3, this morning by Mr. Jones.

A. Yes.

X Q. 141. And you did not refer to the short swivel spout which you now refer to?

A. No, sir, not to my recollection.

X Q. 142. As I understand you if this photograph, Defendants' Exhibit No. 19' shows anything of your spouting system it is only the short swivel spout to which you have referred?

A. Yes, sir.

X Q. 143. Did you use the same kind of a hoist bucket for hoisting the concrete in the tower 1 or Exhibit No. 19' that is shown in full

lines at the bottom of the tower opposite page 42, Defendants' Exhibit No. 21?

A. Yes, also shown on page 42 of the same exhibit, 21.

X Q. 144. The position of this hoist bucket discharging the concrete into the concrete bin is shown in dotted lines at the upper end of the tower on the sheet opposite page 42 of Exhibit No. 21 (Defendants'), is it not?

A. Yes, that refers to the bucket only.

X Q. 145. Can you find this bucket shown in Defendants' Exhibit No. 19′?

A. In that case the bucket is at the bottom of the tower.

X Q. 146. And is now shown in the photograph?

A. The photograph is so blurred that you cannot see the position of the bucket.

X Q. 147. What part of the photograph do you refer to as being blurred?

A. From the top oof the roof slab down.

X Q. 148. In your testimony this morning in answer to Q. 10, and [fol. 164] also in your affidavit executed August 6, 1920, you refer to the part marked 2 in the photograph Exhibit No. 19′ as the bucket; do you still think that the part 2 designates the bucket?

A. No, it indicates the hopper.

X Q. 149. And the part 3 in that case indicates the lower end of the hopper, does it not?

A. The lower end of the hopper and the swivel head.

X Q. 150. As a matter of fact, doesn't the reference numeral 3 in this exhibit indicate a part similar to or identical with the part marked "Bin Gate" on the drawing opposite page 42 of Defendants' Exhibit 21?

A. No. We did not use the same construction of the concrete bin as indicated on the opposite page 42. Our hopper was made of wood constructed according to my own design.

X Q. 151. Do you mean to say that the part designated by the reference numeral 3 in Exhibit 19′ is the part to which you have heretofore referred to as the swivel short spout?

A. A swivel short spout and hopper combined all construtced of wood. This bin which you have here is made of iron and construtced by the Ransome people and was not much used at that time (Exhibit 21, opposite page 42).

X Q. 152. Please examine the photograph Exhibit 19′ and state whether or not you can see the swivel connection which you have referred to between the part 3 and the part 2.

A. I can just see a slight part of it, the rest of it is hidden by the form work of the building.

X Q. 153. I can't see where any part of the connection between 3 and 2 is hidden by the from work of the building. Won't you please be a little more definite?

A. Don't you see how it passes out over that form work which I have marked N?

[fol. 165] X Q. 154. Yes, but the point which you have marked is below the connection between the part 3 and the part 2.

A. You can't scrutinize that in so much detail without drawing it out to larger size, as the photograph is not clear enough.

X Q. 155. I have indicated a part upon the drawing Exhibit 19' by the reference letter P. Please say what that part is.

A. I would say that is as near as I can make it out, the upper part of the hopper.

X Q. 156. Isn't it one of the braces for assisting in supporting the hopper?

A. It may be.

X Q. 157. Now as I understand you, you did not use this spouting apparatus of yours above floor W?

A. No.

X Q. 158. Why did you hang on to the short swivel spout all the time you were using the hopper for pouring the concrete for the floor X and for the roof Y?

A. There was no need of taking it off.

X Q. 159. When you say that this short swivel spout to which you have referred was retained in place during the time that you were pouring the concrete for floor X and roof Y, you are speaking from memory altogether, are you not?

A. As near as I can recollect.

X Q. 160. And you have no data of any kind to refresh your memory on that point, have you?

A. No, sir.

X Q. 161. And as a matter of fact the photograph as to this part of the alleged structure is too indistinct to furnish any information, is it not?

A. No, I would not say that.

X Q. 162. Do you see anything on this photograph that of itself in the photographs looks like a short swivel spouting?

[fol. 166] A. Yes.

X Q. 163. You say this in spite of the fact that you said a while ago that the photograph was too small and indistinct to show details?

A. It would be for the ordinary person not familiar with that class of work.

X Q. 164. In other work I take it that you are basing your testimony upon your recollection rather than what is disclosed in the photograph.

A. By refreshing my memory and looking at that it clears the way. A man might forget all about a thing after years but when the photograph is brought before him his memory is refreshed the same as a phonograph.

X Q. 165. That is what I am trying to say this photograph brings the matter of this building back to your mind and you are testifying from your recollection and not from what you see in the photograph.

A. I say not. I do see certain parts in it that I could not point out to you or anyone else, it is so small in the photograph.

X Q. 166. What kind of a gate did you have at the lower end of that hopper?

A. One of my own design. I don't have to tell you what kind of a gate I had on there, it was one of my own design.

X Q. 167. Well, have you any particular objection of telling me what kind of a gate you had there?

By Mr. Jones: The witness is advised that he need not disclose any other invention not involved in this controversy.

A. I don't care to go into it in detail. The gate opened and closed with a large blade and handle for a cut out.

X Q. 168. Was the gate pivoted as in Defendants' Exhibit No. 21, or was it a sliding gate operated by means of a hand operated lever? [fol. 167] A. I explained that to you a moment ago.

X Q. 169. I don't hardly think you did.

By Mr. Jones: Objection is made to this line of questioning relating to details which the witness has stated he does not care to disclose. It is also objected to as being outside of the scope of the direct examination and also as immaterial.

By Mr. Anderson: Counsel for plaintiffs is trying to ascertain just what is disclosed by this photograph No. 19'. The witness has given some two or three different descriptions of the disclosure and has admitted that the photograph is too small and indistinct to show the details of the structure to which he has been testifying.

A. I have no further answer to make.

X Q. 170. Is the gate which you used to control the discharge of the concrete from the hopper shown in the photograph Exhibit No. 19'?

A. I am under the impression that it is, but it is dim.

X Q. 171. Can you see it in the photograph?

A. I said that I was under the impression that it was, but it is dim.

X Q. 172. Where was that gate located?

A. Located at the discharge of the hopper.

X Q. 173. Was it located in between the hopper and the short swivel spouting to which you referred a while ago?

A. Yes, sir.

X Q. 174. And as I understand that gate was operated by a lever?

A. Yes, sir.

X Q. 175. Now if the part 3, shown in the photograph Exhibit No. 19', indicates the short swivel spouting and the part 2 indicates the hopper and the gate and the handle for operating the same is located between these two parts, why wouldn't it be clearly shown in this [fol. 168] photograph, Exhibit 19'?

A. The photograph is not large enough, and furthermore it is partially covered by the form work.

X Q. 176. The truth is the gate and the lever for operating the same are not visible in this photograph, is not that so?

A. It might not be visible to you but in the construction of that spout I know just the location it is.

X Q. 177. Well, can you actually see it on the photograph?

A. Yes, but not sufficiently to point it out to you.

X Q. 178. In other words, you can see it but you can't point it out to anybody else?

A. As I told you it was too fine in detail to explain it, as a portion of it was hidden by the form work.

X Q. 179. Why didn't you use this chute distributing apparatus for laying the concrete on next to the top floor X?

A. It did not have fall enough. And I had gotten all the knowledge I wanted out of the apparatus.

X Q. 180. Did the hopper 2 occupy the same position as is shown in the photograph during all the time that it was used on the Lynnhaven Hotel building?

A. No.

X Q. 181. What other positions did it occupy?

A. It was placed in different altitudes to accommodate the flow for spouting.

X Q. 182. Would it have paid you to have moved it high enough up to spout the concrete for floor X, the top floor?

A. That was not taken into consideration. We concluded to just leave it where it was and finish up.

X Q. 183. As I understand you then the use of this apparatus on the Lynnhaven Hotel building was for experimental purposes?

[fol. 169] By Mr. Jones: Objected to as calling for a conclusion to be drawn by the court. The witness has stated the fact.

A. It was for the purpose of determining whether concrete could be spouted, successfully.

X Q. 184. This spouting apparatus could be seen by anyone who might be up on the building where the work was going on, either an employee or a visitor, could it not?

A. It could.

X Q. 185. Do you recall whether a chute or trough, other than those to which you have particularly referred, was used in distributing the concrete upon any part of the building a distance from the tower 1 and not in any way connected with tower 1?

A. There was a chute at the end of 5 occasionally to spout at a greater distance (indicating Exhibit 20). And in some cases wheelbarrows were used to convey the concrete at a greater distance.

X Q. 186. But you do not recall the use of a trough or chute other than 4 and 5 in Exhibit No. 20 and a third chute which you say was used at times in extension of trough 5?

A. No, with the exception of the mouth piece with the swivel to it.

X Q. 187. How long was Mr. Andrew J. Kerns employed on this building?

A. I could not say positively, but he was employed for a while with a few laborers excavating, and he was also used as a hoisting engineer on the sidewalk level for a while. Owing to his habits he was not employed steadily.

X Q. 188. Didn't he remain on the job until the concrete was all distributed or laid?

A. No.

[fol. 170] X Q. 189. And didn't he go along and work on the Vinery Building?

A. He worked on the Vinery Building.

X Q. 190. Are you sure that he was not employed on the Lynn haven Building during the entire period that the concrete was being distributed?

A. Yes, sir.

X Q. 191. How far up was this building when you went down and took charge as superintendent, I think you said you were?

A. The piles of the building were driven for the foundation ready to be cut off and ready to start the excavations.

X Q. 192. At the time you filed your application for patent 948,746, dated February 8, 1910, on February 23, 1909, you made an affidavit, did you not, that the invention shown therein had not been in public use in this country for more than two years?

A. I don't remember.

By Mr. Jones: If plaintiffs' counsel has a copy of the affidavit he is requested to show it to the witness to remind him of the details.

X Q. 193. It is customary that such statements or averments appear in the affidavit filed with an application for patent. Assuming that such a statement was sworn to by you in the affidavit in support of your application for your patent, was the statement true?

A. I could not say. It is not clear to my mind.

By Mr. Jones: The question is a very objectionable one as if the witness signed the usual affidavit to this effect he obviously believed it to be true at the time as he understood it. It would be only fair to remind the witness that the affidavit states in substance that the [fol. 171] applicant in such cases believes that such and such things are the fact and does not state the facts more positively.

X Q. 194. How did the hopper and the short swivel spouting, which you say were used by you on the Lynnhaven Hotel building in Norfolk, compare with the corresponding parts shown in your patent No. 948,746?

A. There was no comparison between the two.

X Q. 195. Who were some of the people who worked under you on this Lynnhaven Hotel building?

A. I have no recollection as I had my son there, who has passed out since, I had also another young man who had charge of the concrete, he has passed out also, some five or six years *years* ago. I can't recall any of the names of the other men whom I had with me there in the construction work.

X Q. 196. As I understand you, you were superintendent for Mr. Tatterson for that particular building only?

A. Yes, and the Vinery Building.

X Q. 197. And also, as I understand it, Mr. Baker was general superintendent for Mr. Tatterson?

A. Not on this particular job.

X Q. 198. Do you mean that he was not general superintendent for Mr. Tatterson? Wasn't that his title?

A. Not that I knew of. Previous to my going down there he had been Mr. Tatterson's general superintendent but Mr. Tatterson came to Washington and employed me and gave me full control of

this work without any interference, and during the construction of this work Mr. Baker was in charge of two jobs, the Fairfax Hotel and the Paul Greenwood office building which occupied all his time, and Mr. Tatterson put on two other superintendents on other work, so that was the situation.

X Q. 199. According to your recollection, how often did Mr. Baker visit the Lynnhaven Hotel building as it was being constructed under your superintendency?

[fol. 172] A. To my recollection he was never on the building over twice during the whole construction of the reinforcement, and that was by invitation of myself as a friendly visit, not in connection with the work.

X Q. 200. And about how many months was that?

A. About three and one-half months.

X Q. 201. And I understood you to say this morning that you never saw Mr. Roland Brinkley on the work?

A. Only to consult me in the office.

X Q. 202. You never saw him up on the building at all?

A. Never on the building.

X Q. 203. And how about Mr. Walter N. Thornton; did you ever see him on the building during the construction of the concrete portion of the building?

A. Many times, as he had the contract of the plumbing.

X Q. 204. And how about Mr. J. Samuel Goldback, did you ever see him on the building during the time that the concrete portion thereof was being constructed?

A. He was there occasionally to consult with his foreman in running the conduit work for the electric lighting.

X Q. 205. From the time that you began using this spouting system for distributing the concrete on the fourth floor to the seventh floor marked W on Exhibit No. 19', was it continuously in use for the distribution of concrete on these floors?

A. No, sir.

X Q. 206. What I tried to ask, was all of the concrete on those floors four to seven inclusive distributed by the spouting system?

A. No, sir.

X Q. 207. Do you mean that you used this spouting system for a little while on each floor and then take it down and get rid of it?

A. No, there were intervals when we used wheelbarrows where it [fol. 173] was not necessary to use the spouting, as the distances were greater or sometimes shorter, the shorter distance we used wheelbarrows for distribution owing to the shape of the building. The building was an L-shaped building and we could not use the spouting at all times as it was not complete a layout as that of the Coliseum building, but at the same time proved its purpose.

X Q. 208. What you mean is this, that in case the place where you wanted to put the concrete was further away than the combined length of the troughs you wheeled from the ends of the trough to the place where you wanted to put the concrete?

A. Yes, and when the distances were less than or shorter than the

length of the first trough 4 and we wanted to deposit the concrete under the chute, we used wheelbarrows.

X Q. 209. Then as I understand you even while you were using the wheelbarrows as you have just described, the spouting remained in place, that is, was not taken down?

A. Not altogether, not until we go higher up. These, chute 5, were taken away as the work was filled in the spouts were removed from time to time.

X Q. 210. Do you mean by that, that you started by discharging the concrete either from chute 5 or from the third chute not shown and that when you had finished the work as far as you could with that particular chute you removed and then began discharging from the next chute closer toward the tower?

A. Yes, sir.

X Q. 211. At such times as Mr. Thornton, Mr. Goldback and others may have gone up on the building, there is no reason why they should not have seen this spouting, was there?

[fol. 174] A. If they were sufficiently familiar with concrete work and took an interest in it they could see it.

X Q. 212. It was there for them to see?

A. Yes, sir.

X Q. 213. Except in the case of those persons which have been mentioned here today, do you recall a single other person who either worked on the building or visited on the building who might have seen this spouting of yours at that time?

A. The superintendent for the architects Mr. Preston and Mr. Tatterson's son were the only two that I remember.

X Q. 214. By the way, wasn't Mr. Tatterson's son at college at that time?

A. He was at college part of the time and then he came home and started to work for me as timekeeper.

X Q. 215. When was that, in the summer of 1907?

A. In the summer of 1906 and 1907.

X Q. 216. You have previously today referred to Mr. John S. Bronson; do you recall any conversation you had with him in regard to the boom construction at the top of the tower employed in distributing the concrete at the Coliseum Building in St. Louis?

A. No, he never conversed with me on that, he was not a practical man he was merely an agent for concrete mixers.

X Q. 217. Wouldn't he as agent for such mixers have been much interested in any improved means for distributing concrete?

A. Well, I naturally would suppose he would be interested in such things, but his purpose on the work was merely to become familiar with how to handle concrete.

X Q. 218. As a matter of fact, did he ever show any displeasure to you or annoyance because you had filed the application for this patent 948,746?

[fol. 175] A. No, I don't think he knew that I had applied for a patent.

X Q. 219. Didn't you tell him that you had applied?

A. No.

X Q. 220. If you invented and used the spouting system on the Lynnhaven Hotel Building in Norfolk in 1906, as you have testified, how do you account for not having filed an application for patent until February 23, 1909?

A. I was not in position, financially, and therefore did not intend to open the way and let others in on the patent, as I was confident that it was a good scheme and I thought that there were other parts of the apparatus that might be taken up, which is generally the case, and improved upon.

X Q. 221. I show you Exhibit No. 1, attached to the rebuttal affidavit of Andrew J. Kearns, which was executed the 23rd day of August, 1920, and call your attention to the hopper 3, shown in the side elevation the bottom figure, and will ask you whether or not it is a fairly correct representation of the shape of a hopper used for discharging the concrete on the Lynnhaven Hotel Building?

A. No.

X Q. 222. What is the matter with it?

A. I had a different construction from that entirely. This is taken from an old hopper which was in general use at Norfolk when I was down there, mine was a different design.

X Q. Well, doesn't the side view to which I have just called your attention present an appearance quite similar to the view of the hopper 2 shown in the photograph Defendants' Exhibit No. 19'?

A. No.

X Q. 224. To control the discharge end of the hopper No. 2, [fol. 176] shown in the photograph did you employ a sliding door, such as that shown in 4 of the top figure of the Exhibit No. 1, above referred to?

A. No, a different design from that.

X Q. 225. But you did employ a sliding door in that construction?

A. A cut-out which I have explained in my previous testimony.

X Q. 226. Did you employ a pivoted cut-out or a sliding cut-out?

A. I don't understand what you mean by a pivoted cut-out. It was fastened on one end with a lever.

X Q. 227. If you will look at the top figure of the sketch Exhibit No. 1 you will notice a lever 5 pivoted at 6 to a part of the hopper structure and connected at its end to the sliding door 4, in the construction employed by you did you employ a lever similar to the lever 5 and did you operate the door to open and close it by such lever?

A. It was not the same design as you have here. I had a lever.

X Q. 228. Did the lever employed for operating the door or gate project outwardly from the hopper?

A. Yes, but owing to the swivel construction the gate had to be different from this.

X Q. 229. And you still desire to testify that whatever gate you employed and the lever for operating it were located between the parts 3 and the parts 2, in Defendants' Exhibit No. 19'?

A. Yes.

X Q. 230. Do you recall from which side of the hopper it was the lever projected?

A. No, sir.

By Mr. Anderson: The affidavit of Andrew J. Kerns and the Exhibit No. 1 attached thereto referred to above are marked for [fol. 177] identification, "Kern's Affidavit and Exhibit No. 1."

Cross-examination closed.

Redirect examination:

R. D. Q. 231. After seeing Mr. Hopkins in Washington, through what cities did you pass in beginning your trip to the Philippines?

A. I stopped in St. Louis, Salt Lake and San Francisco, and sailed from there to the Philippines.

Notice is given that depositions of T. A. Tatterson and R. B. Preston will be taken Monday January 17th in Norfolk, Va., beginning 10 a. m. at the offices of Hughes, Little & Seawell, Law Building.

Deposition closed.

ARTHUR L. SMITH.

Met pursuant to notice, Monday, January 17, 1921, at 10 a. m., and adjourned to the offices of Hamilton H. Chalkley, Notary Public, Room No. 532 Law Building, Norfolk, Virginia.

Present: Cyrus N. Anderson, for plaintiffs; George Bayard Jones, for defendants.

ROBERT B. PRESTON, another witness called on behalf of defendants, being first duly sworn, testifies as follows in answer to questions by Mr. Jones:

Q. 1. Please state your name, age, residence and occupation?

A. Robert B. Preston; age, 39; residence, Norfolk County (Ocean View, Va.); civil engineer. I am engineer to the Commission of Roads and Bridges for the County of Norfolk.

Q. 2. What was your occupation in 1906?

A. The last half of 1906 I was superintendent or inspector rep- [fol. 178] resenting the architects in the construction of the Lynnhaven Hotel, Norfolk, Va.

Q. 3. Outline briefly your training and experience.

A. Besides the schooling that I have had and general experience in railroad work, etc., I was connected with the firm of Ransome & Smith in the construction of large concrete factory buildings in New York State, and since that time have had continuous experience in construction work.

Q. 4. Did you ever know Arthur L. Smith?

A. Yes. He was superintendent for E. Tatterson, the contractor constructing the Lynnhaven Hotel mentioned above.

Q. 5. If you are familiar with the appartus which was used to mix and distribute the concrete during the erection of this hotel, please describe it.

A. The machinery for mixing the concrete was situated at the ground on the Freemason Street side of the Lynnhaven Hotel, and the concrete, after being discharged from the mixer, was raised to the elevation of the several floors upon which it was to be deposited by means of a hopper or lift commonly known as a Ransome hoist. Afterwards, the concrete being dumped into a hopper and later removed for placement upon the floor slab and other portions of the building under construction. As heretofore stated, my recollection of any other method for distributing this material is rather vague, owing to the fact that several years have elapsed since that time during which period I have had to do with a considerable amount of work, and also for the reason that as the representative of the architect my interest was solely in the character of construction being performed and not the means by which it was delivered to the point of deposit,—I mean by this that it was my duty to see that the concrete was properly mixed and applied and therefore I was not particularly interested in the means the contractor used in getting the [fol. 179] material placed on the floors; however, I do remember that one or possibly two wooden troughs were constructed and placed on benches or "saw-horses," by means of which the concrete was distributed over a restricted area around the hopper. In other words, when the area on which no concrete had been laid had become so confined as to make the use of wheelbarrows impractical these troughs were used.

Q. 6. On what was the hopper supported?

A. The hopper, as I remember it, was supported from the hoist, and the hoist was a structure built from the ground to the different floor levels, by means of which the concrete was elevated. I do not remember the exact details of the construction of this hoist.

Q. 7. What is the present name of the Lynnhaven Hotel, and where is it located?

A. It is now called the Southland and is located on the southwest corner of Granby and Freemason streets, Norfolk, Va.

Q. 8. Did the hopper always remain at the same height on the hoist throughout the work?

A. No, it was elevated from time to time or from floor to floor as the work progressed.

Q. 9. Was the hoist of fixed height?

A. No, the hoist, as I remember it, was raised once or twice during the construction. That is the usual practice.

Q. 10. I call your attention to Defendants' Exhibit 21 and ask if the drawing opposite page 42 is a fair representation of the Ransome outfit which you have stated was commonly known about 1906?

A. Yes.

Q. 11. What can you say with reference to the work of Ransome in connection with the art of reinforced concrete buildings?

[fol. 180] A. It is a matter of record that Earnest L. Ransome was the father or pioneer in the construction of reinforced concrete buildings, etc., and during the time of his activity, I believe, there was no higher authority on this character of construction than he.

Q. 12. Is he the Ransome in the firm of Ransome & Smith you referred to?

A. Yes.

Q. 13. I call your attention to Defendants' Exhibit 19, and ask if you recognize the structure?

A. Yes, it is the concrete framework of the Lynnhaven Hotel.

Q. 14. Do you recall about when this building was begun and finished?

A. I went to work for the architect about the 6th day of September, 1906, at which time all excavations had been made and piling for foundations driven and that, together with the fact that I have today seen a plan of this building in the office of the architect in charge of the work, dated June 14, 1906, leads me to believe that the work of actual construction of the building was begun about the middle of the summer of 1906. Upon visiting the architect's office this morning, I learned that Mr. J. Van Peebles was out of the city, Mr. Peebles being the architect in charge of the design and construction of the Lynnhaven Hotel.

It is stipulated that opposing attorneys visited the architect's office this morning and were shown a tracing comprising a front elevation of the Lynnhaven Hotel, dated June 14, 1906, and that if the draughtsman were called to testify he would testify that said tracing was made on or before that date.

Q. 15. Do you recall about when the hotel was finished?

A. In the spring of 1907, probably shortly after the 1st of April.

[fol. 181] Q. 16. Is there anything to help fix this date of 1907?

A. Yes; this is fixed as being the date of the opening of the Jamestown Exposition, for which opening those concerned were endeavoring to have the hotel ready for occupancy.

Q. 17. In what year was the exposition held and what did it celebrate?

A. It was held in 1907 and was in celebration of the three hundredth anniversary of the settlement of Jamestown.

Q. 18. I call your attention to Defendants' Exhibit No. 20 and will ask if this sketch corresponds in its general features with the Arthur L. Smith apparatus you have previously referred to?

A. In a general way it does.

Q. 19. About the time this building was built, what was the practice with regard to the consistency of concrete?

A. Concrete for reinforced building construction was made wet in order that it might be placed around and percolate through the reinforcing bars used in the construction of buildings. This was necessary in order that a dense mass might be created around the bars and in the members being built.

Q. 20. Has there been any change in this practice during your experience?

A. Yes. Before that period the government and others particularly in the construction of large foundations, etc., used a concrete very much dryer, it being necessary to lightly tamp same to flush water to the surface. But personally I have never seen dry concrete used in the construction of beams, girders, columns, etc., of buildings.

Q. 21. At the time the Lynnhaven Hotel was built, did it represent an established type of building construction in this city?

[fol. 182] A. No. I am pretty positive that the Lynnhaven was the first reinforced concrete building constructed in Norfolk.

Q. 22. About how long were the individual sections of the wooden troughs which you say were used by Mr. Smith?

A. I don't remember exactly as to their length, but probably between 10 and 16 feet for each section. The standard length of lumber ordinarily being in even feet, or for instance, 10, 12, 14, 16 and so on.

Q. 23. Were you connected in any way with the construction work on the Vinery building in this city?

A. I was there for a short while after the beginning of the work and later left to take a position with the Government.

Q. 24. Was Arthur L. Smith on this job?

A. Arthur L. Smith was in charge of the job for the contractor when I left it.

Q. 25. Did you see any chutes in connection with this work?

A. As I recollect it, only the foundations for the Vinery were in when I left the job, but it is my recollection that troughs were used in depositing the concrete in the foundations immediately adjacent to the concrete mixer.

Q. 26. When did you first hear of this patent litigation?

A. In the summer of 1920, I don't remember the date exactly.

Q. 27. How did you happen to hear of it?

A. I was told of it by Mr. Anderson who came to see me concerning it.

Q. 28. You refer to Cyrus N. Anderson, one of the attorneys for the plaintiffs, here in the room?

A. Yes, though at the time I did not know whom Mr. Anderson was representing.

[fol. 183] Q. 29. What did Mr. Anderson inquire about in this connection?

A. His inquiries were practically along the same lines as followed in this examination.

Q. 30. Did you answer along substantially the same lines?

A. Yes.

Q. 31. Did you sign an affidavit or other statement at that time?

A. No.

Q. 32. Did the concrete flow without restriction from the hopper to the trough when this apparatus was used on the Lynnhaven Hotel job?

A. Yes, ordinarily it would do that.

Q. 33. You mean there was no way to control the flow?

A. No, I mean that when the gate which held the concrete in the hopper was raised to release the material, the concrete would flow to the trough.

Q. 34. Who operated the gate?

A. It was operated by a laborer.

Q. 35. Do you remember where he stood with reference to the apparatus in general?

A. As I remember it, he stood on a slight elevation at the right of the hopper, facing the hoist from the building.

Q. 36. Are wheelbarrows and carts used at all today in the erection of buildings made of concrete?

A. Yes, they are used by some contractors, particularly on smaller jobs.

Q. 37. The plaintiffs in this case filed in court in the fall certain affidavits. Are you acquainted with Andrew J. Kerns who executed an affidavit August 23rd, 1920?

A. Yes.

Q. 38. Do you recall whether he was employed on the Lynnhaven Hotel throughout the work?

A. It seems to me that he was. He was employed there as a saw-[fol. 184] filer when I first went on the job. Later, I believe he had charge of placing the reinforcement in the building and was afterwards the foreman under Arthur L. Smith, the superintendent and if he left the work before it was completed I don't remember it.

Q. 39. Please look at the photograph attached to Kerns Affidavit and Exhibit No. 1 and state if the sketch therein is an accurate showing of the hopper arrangement as you recall it.

A. In a general way it is, although there are some minor details which are probably different due to Kerns' lack of experience as a draftsman.

Q. 40. Of what material was the Smith hopper made, if you recall it?

A. I don't recall it particularly well.

Q. 41. Was it the standard Ransome hopper?

A. I think not. I think it was one constructed by Smith.

Q. 42. As I understand your previous answers, Kerns' duties were such that he would not necessarily have been on the uppermost floor all the time while the building was in progress, is that correct?

Mr. Anderson: Objected to because the question apparently is stating an inference and because further the facts as stated by the witness do not justify the statement as made in the question.

A. It is hardly likely that he would have been on the upper floor all of the time, except when being employed as foreman or in placing reinforcement.

Q. 43. If you recall W. N. Thornton who made an affidavit August 30th, stating that he was a plumbing and heating contractor having something to do with the Lynnhaven Hotel, kindly state the nature of his duties?

A. I recall the name of Thornton, and as I remember it, he was a subcontractor in charge of installing plumbing and heating system for the building.

[fol. 185] Q. 44. Would his work keep him on the uppermost floor?

A. Not entirely.

Q. 45. Do you recall Roland Brinkley?

A. Yes. He was office man and general timekeeper for E. Tatterson.

Q. 46. Did he spend most of his time on the uppermost floor of this building?

A. He spent very little time on the building at all.

Q. 47. Do you recall J. Samuel Goldbach in the electrical contracting business?

A. There were two men, brothers of that name, on the building, whom I recall, though I don't know now which one was Samuel.

Q. 48. Did you know Wm. T. Baker?

A. Not personally. At the time I was on the Lynnhaven I know that a man named Baker was employed by Tatterson, being in charge I believe of the construction of the Paul-Gale-Greenwood Building at the corner of Granby street and City Hall avenue.

Q. 49. Was he Mr. Tatterson's general superintendent?

A. I don't know what his title was.

Q. 50. Is Mr. Tatterson living now?

A. No, he is dead.

Q. 51. Do you know his son?

A. Yes. He has two sons, the older one named Townley.

Q. 52. Were either of these sons seen by you on the Lynnhaven job at any time?

A. Yes. Townley was on the job as timekeeper.

Q. 53. Where is the Vinery building?

A. It is on Granby Street, east side, approximately 200 feet south of Freemason Street.

Direct examination closed.

[fol. 186] Cross-examination by Mr. Anderson:

X Q. 54. Did I understand you to say on direct examination that Kerns became foreman of the concrete work?

A. I remember it, yes, sir.

X Q. 55. And do you recall about when he became foreman?

A. No, I don't, but it was probably sometime in the fall of 1906, I don't remember that.

X Q. 56. And as foreman he was present while the concrete was being placed upon the different floors, was he not?

A. Yes, when he was foreman.

X Q. 57. Do you recall whether he was foreman from the time that they first began laying concrete?

A. I don't think so.

X Q. 58. During the time that he was foreman, at least, he would have been familiar, would he not, with the means employed for distributing and placing the concrete?

A. Yes.

X Q. 59. And as you remember it, he remained in the employ of Mr. Tatterson and worked on this building until the concrete portion of the work was completed?

A. That is my recollection of it.

X Q. 60. You have stated your recollection is "that one or possibly two wooden troughs were constructed and placed on benches or 'saw horses,' by means of which the concrete was distributed over a restricted area around the hopper." Have you any distinct recollection that more than one trough was used?

A. As I stated before my recollection as to these troughs or this trough is rather indistinct.

X Q. 61. And it is my understanding that no support other than the benches referred to by you was used for supporting the trough?

[fol. 187] A. I don't remember the cable as shown on plans I have seen (I refer to the drawing Defendants' Exhibit No. 20), as supporting the trough.

X Q. 62. Then it is your recollection that the trough numbered 4 on Defendants' Exhibit No. 20 was supported by benches and not as shown in that exhibit?

A. My recollection is that the end of the trough furthest away from the hopper was supported on a bench, though of course the end at the hopper was supported by some means.

X Q. 63. Do you remember what that last mentioned means was?

A. I do not.

X Q. 64. Will you make a sketch showing the side elevation as you recollect it of the hopper employed for receiving the concrete from the hoist bucket?

A. I don't think that my recollection of the construction of the hopper is sufficiently clear for me to make a true sketch of same, remembering it as I do in only a general way.

X Q. 65. And you have no *distant* recollection then as to how the upper end of the trough designated 4 in Defendants' Exhibit 20, was supported?

A. No.

X Q. 66. Have you any distinct recollection of having seen troughs like those shown in Exhibit 20, shifted around into different positions for depositing the concrete at different places?

A. No, I do not recollect that they were shifted as shown by different angles drawn on Defendants' Exhibit 20.

X Q. 67. Have you been engaged in concrete work prior to the time that you began your work on this building as representative of the architect?

[fol. 188] A. Yes. My position on that building was secured absolutely through a letter of recommendation from Mr. Earnest L. Ransome personally, with whom or by whom I was previously employed.

X Q. 68. And in your previous work for Mr. Ransome had you seen concrete used in the construction of buildings?

A. Yes, extensively. One job at Rochester, N. Y., in particular, which was many times as large as the Lynnhaven Hotel.

X Q. 69. How did the concrete employed in the construction of the Lynnhaven Hotel Building compare with the concrete pre-

viously used in the construction of concrete buildings with which you were familiar?

A. Practically the same consistency, being a mixture of one part cement, two parts sand, and four parts gravel or broken stone. The water in the concrete, being practically the same.

X Q. 70. That is to say, the concrete employed in the construction of this building was of substantially the same firmness or softness as the concrete previously used by you?

A. Yes.

X Q. 71. And more water was not used to make it softer so it would flow down the trough. That is your understanding, is it not?

A. Not that I recollect. My object was to get a concrete consistent with good construction, regardless of what it did in the trough.

X Q. 72. Is it your recollection that a trough was used for distributing the concrete on all the floors of this building?

A. I don't remember as to that.

X Q. 73. I wish you would take photograph, Defendants' Exhibit No. 19′, and examine the hopper as shown near the top of that [fol. 189] photograph and state whether or not it recalls to your mind the construction of the hopper with sufficient definiteness to enable you to make a sketch of the same?

A. No, sir, that only gives you a general outline of one side of the hopper; it does not show any details on the front part of the hopper at all as to the means of raising the gate for releasing the concrete from the hopper, or as to anything that may have been placed there for the holding up of the trough.

X Q. 74. Do you mean that the gate is secured to a part of the hopper beyond or in front of any portion of the hopper construction which is shown in this photograph, Defendants' Exhibit 19′?

A. As I remember it, the gate consisted of a piece of steel which worked on a hinge placed at the lower part of the hopper, raised up and down by means of a lever in the hands of a workman, thus creating a space through which the concrete flowed into the troughs or wheelbarrows, as the case might be.

X Q. 75. And it is your understanding then that the lower end of the hopper is not shown in this photograph?

A. Not with sufficient distinctness for me to make a drawing of it from that protograph.

X Q. 76. Are you able to find in this photograph, Exhibit No. 19′, any portion of the spouting or troughs which it is claimed were used in the distribution of the concrete?

A. No.

X Q. 77. And I understand also that you have no recollection of any swivel connection between the upper end of the trough 4 shown in Exhibit 20 and the lower end of the hopper?

A. No.

X Q. 78. As a matter of fact, was or was it not common practice [fol. 190] prior to the time that you took up your work on the Lynnhaven Building, to dump concrete through an ordinary trough,

temporarily supported in some suitable manner, into foundation work or other similar work?

A. I have used a trough running directly from the concrete mixer to point of deposit in the construction of large footings or abutments where the bulk of the concrete is distributed close to the point of mixing. With Ransome, no troughs were used because the means of transporting the material was from a central dumping point along constructed runways in concrete carts and dumped from them.

X Q. 79. Then the troughs which you have used have been in more recent years, that is, subsequent to the construction of the Lynnhaven building?

A. No, prior to the construction of the Lynnhaven Building; in Pennsylvania on railroad construction.

X Q. 80. Were these troughs supported on trestles or benches or just how were they supported?

A. The point of deposit being very much lower than the mixer the trough rested simply on the edge of the excavation, being held in place by stones. That was a very short trough, of course, probably only 10 feet long.

X Q. 81. Isn't it probable therefore that the reason why you do not recall more distinctly the construction employed on the Lynnhaven Building was because a single trough was used and you saw nothing peculiar in it over and above what you had already used?

Mr. Jones: Objected to as grossly leading and as calling for an immaterial conclusion.

A. I couldn't say that that was my reason for not remembering distinctly the details in the matter, but rather, as stated above, that I was not particularly interested in the means of conveying the material to point of deposit.

X Q. 82. You have testified that the cable designated 10 shown [fol. 191] on Exhibit No. 20, was not employed in connection with the Lynnhaven Hotel construction. Was the trough 4 shown in that exhibit, supported upon benches?

A. I testified that I remembered that the trough was supported on benches; I did not testify that the cable was not used but that personally I did not remember of its having been used.

X Q. 83. How far along had the pouring of the concrete proceeded on the Vinery Building when you discontinued your work in connection with that building?

A. As I remember it, at the time I left the building, all piles had been driven, excavations made, and a part and possibly all of the footings poured.

X Q. 84. What is your recollection as to the use of troughs for distributing the concrete during the time you were employed on that building?

A. They could not have been used every extensively up to that time because the concrete mixer was stationary, whereas the footings were widely scattered and therefore this practice could only have

been pursued in pouring the footings immediately adjacent to the mixing plant.

X Q. 85. Have you actual recollection of the use of troughs in pouring the footings immediately adjacent to the mixing plant?

A. No, I would not testify that I actually remember this being done on this building.

X Q. 86. What recollection have you as to the proportion of floor area on which the concrete was distributed or placed by means of troughs on the Lynnhaven Building?

A. I would say not in excess, I should think, of ten per cent. of the floor, although this is an approximation.

X Q. 87. Is it your recollection that troughs were used for distributing the concrete on the top floor and also on the roof?

[fol. 192] A. I don't believe that they were used on the roof or top floor, though I am not clear as to that. However, I do not believe that the hoist was constructed to a sufficient elevation to have admitted of this process on the roof of the building.

X Q. 88. How about the top floor?

A. It might possibly have been done on the top floor; I don't remember.

X Q. 89. Do you recall whether or not there was a short spout or trough between the upper end of the trough 4 and the hopper 3 shown in Defendants' Exhibit No. 20, the trough and hopper being shown in sketch Defendants' Exhibit 20?

A. I do not recall it.

X Q. 90. You are familiar with the use of troughs or spouting as now employed in the distribution of concrete for buildings, are you not?

A. In a general way, I am, but since this system has come extensively into use I have been employed not on building work but in the construction of roads and streets.

Q. 91. Do you remember about how long ago it was that this system came into use?

A. I think within the last four or five years, to any extent.

Redirect examination by Mr. Jones:

R. D. Q. 92. You stated that you do not recollect that the troughs (X Q. 66) were shifted as shown by different angles drawn on Defendants' Exhibit No. 20. Did you mean to imply that they might have been shifted to some other angle, or that they were not shifted at all?

A. What I mean is that I do not remember that the troughs were so constructed with a hinge or otherwise, or in such a collapsible manner as to admit of shifting them indiscriminately over the area covered, though of course the supports may have been shifted to [fol. 193] admit of depositing material at different points within the area reached by the troughs.

R. D. Q. 93. Do you recall in a general way whether the upper end of the upper chute was connected to the hopper in such a way that the chute may have been moved somewhat from side to side at its outer end to change the direction in which the chute was pointed?

Mr. Anderson: Objected to because the witness has already testified that he does not remember what the connection was between the upper end of the chute shown in Defendants' Exhibit 20 and the hopper.

Mr. Jones: The question does not ask for the specific connection but whether it would permit the outer end of the chute to be moved in the manner stated.

A. I do not remember the details of construction at the junction point of the hopper and the chute.

R. D. Q. 94. However, such an arrangement would have been a very natural thing, would it not, in view of the obvious purpose of the apparatus?

Mr. Anderson: Objected to as a conclusion of counsel and as grossly leading.

A. That would depend upon the object of the apparatus. If it was the desire of the operator to distribute the material at different angles from the hopper, it is natural to suppose that some such arrangement would have been neecssary, but if the material was only to be delivered straight away from the hopper a stiff trough would have served.

R. D. Q. 95. Do you recall that the trough or troughs always pointed in the same direction when you saw them, or was there any variation in the same?

[fol. 194] A. As I think I have stated before, I do not remember as to whether there were any variations in the angle from the hopper.

R. D. Q. 96. Prior to 1906, had you ever seen a chute for concrete or any other purpose, supported at one end by a block and tackle or a boom and pivotedly supported at the other end so that the outer end might swing to the arc of a circle?

A. No.

R. D. Q. 97. Did Mr. Anderson, previously referred to, request you to sign any statement or affidavit at the time you say you saw him, approximately last summer?

A. I don't recall that he did.

Recross-examination by Mr. Anderson:

R. X Q. 98. Is this Lynnhaven Hotel Building an L-shaped building?

A. No, as I recall it, it is not exactly an L-shaped building, but is more in the shape of a "U," with a court in the back of it. It is hard to remember those details right off-hand.

R. X Q. 99. Do you recall whether a trough was used for placing the concrete at any other place on this building except in proximity to the hoisting tower?

A. I don't know exactly what you mean by proximity. How close proximity.

R. X Q 100. You have testified that it is your recollection that one or possibly two troughs were used for receiving concrete from the hopper. Now, what I want to know is, do you remember whether

or not a trough was used for placing the concrete at any point a distance clear beyond that which could possibly have been reached by the trough or troughs which you have stated you do remember?
[fol. 195] A. As I have stated before, I do not believe that the concrete was deposited from the troughs at a distance exceeding 30 or 40 feet from the hopper.

Deposition closed.

Robt. B. Preston.

Adjourned to 2 p. m.

Met pursuant to adjournment.

TOWNSEND A. TATTERSON, another witness called on behalf of the defendants, being first duly sworn, testifies as follows in answer to questions asked by Mr. Jones:

Q. 1. Please state your name, age, residence and occupation.
A. Townsend A. Tatterson; age, 35; residence, 1019 Brandon Avenue, Norfolk, Va.; occupation, Inspector of Construction U. S. Navy.
Q. 2. Are you familiar with the apparatus used for distributing concrete on the Lynnhaven Hotel?
A. Yes.
Q. 3. What was your connection with this work?
A. Timekeeper for my father, who was the contractor, Mr. E. Tatterson.
Q. 4. Describe briefly the apparatus referred to beginning with the mixing of the concrete.
A. My impression of the matter is that he had a tower built on the Freemason Street side of the building, with the concrete mixer on the ground level. The concrete was dumped into a conveyor and was hoisted to the desired point, where it was dumped into a hopper and it was distributed on the building by the means of a trough.
Q. 5. How was the trough supported?
A. By horses.
Q. 6. Can you describe this apparatus a little more fully?
[fol. 196] A. My impression of the matter is that this hopper was built alongside of the tower with some kind of a connection, swivel connection, I should say—I don't know what kind of connection it was. At this connection was a gate that controlled the flow of the concrete through the trough, which was controlled by a laborer; he raised and lowered the gate as he wanted it.
Q. 7. What became of the concrete when it reached the end of the trough?
A. It was deposited wherever they wanted it.
Q. 8. How could the point of deposit be changed?

Mr. Anderson: Objected to because it is suggestive of the answer desired, and it is clearly leading.

A. By swinging the trough.

Q. 9. How was the trough swung?

A. In what way, do you mean? The trough was swung by moving the horses and swinging the first trough around on its support, which was swung, according to my recollection, by means of a cable or rope; which of the two I don't remember. It was one or the other.

Q. 10. You have referred for the first time to "the first trough," and also the trough. Do you mean to imply there was more than one trough?

A. Yes.

Q. 11. How many of these troughs were used on this work?

A. It is hard for me to say, but I think two or three.

Q. 12. About how long were the individual troughs?

A. I should say they were as long an average board, 14 or 15 feet.

Q. 12a. You have referred to a cable or rope for the first trough. Please explain how this cable or rope was connected?

[fol. 197] A. I think it was connected from the top of the tower to the end of the first trough.

Q. 13. On what was the hopper mounted?

A. The hopper was made fast to the tower.

Q. 14. About how high was the hopper above the point at which the concrete was being deposited?

A. Do you mean deposited into the hopper or on to the floor?

Q. 15. I mean on the floor or wherever it was being deposited.

A. I should say the hopper was up a sufficient height in order to get a good flow, a strong flow. To the best of my recollection the hopper itself was two floors higher than the actual work.

Q. 16. What was the floor made of that you referred to?

A. What do you mean, the forms?

Q. 17. Yes.

A. Wooden forms.

Q. 18. Then, as I understand your previous answers, the concrete flowed from the hopper on the tower through a gate controlled by a workman and through two or possibly three lengths of trough, and was deposited directly onto the forms from the last section of trough. Is that correct?

By Mr. Anderson: Objection is made to counsel for the plaintiffs testifying. The question is obviously leading and every objectionable.

A. Yes.

Q. 19. Was it ever necessary to deposit concrete at a greater distance from the hopper than the combined lengths of the troughs? And if so, what was done in that case?

A. They run it into wheelbarrows and wheel it.

Q. 20. From what was it run into the wheelbarrows?

[fol. 198] A. Run through the chute.

Q. 21. Which chute?

A. The concrete chute is the only chute I know. They run it through the chutes as far as they possibly could into a wheelbarrow and wheeled it to a distance that they could not carry by the chute.

Q. 22. You have stated that one of the troughs was swung by moving the horses. Did this trough remain in line with the first section of trough in all cases?

A. Yes, it did when it come to shooting it out at a right angle, getting it out in a straight flow. Of course there were exceptions to this.

Q.23. Please describe the exceptions?

A. Well, for instance, if you wanted to shoot some concrete along the tower itself, he would back his concrete up to a short chute, which was shot into another small chute back into the tower. I wouldn't say into the tower, around the tower.

Q. 24. I call your attention to a photograph, Defendants' Exhibit 19', and ask if you recognize the structure shown therein?

A. Yes, that is very familiar. That is the frame construction of the Lynnhaven Hotel built by my father.

Q. 25. Is your father living?

A. No.

Q. 26. Was your father the E. Tatterson whose name appears on the sign in the photograph?

A. Yes.

Q. 27. I call your attention to Defendants' Exhibit No. 20 and will ask if this sketch is an approximate representation of the apparatus you have been describing.

A. Yes, sir, this is approximately what I have been trying to tell you.

Q. 28. What do you say the dottted lines indicate in this sketch, referring to the actual use of the apparatus?

[fol. 199] A. Well, this dotted line is what I tried to tell you about backing the concrete up from the main chute into a smaller chute and distributing it around the tower. Again the dotted line looks as if you could raise or lower this by means of pulleys which could distribute the concrete at a different angle.

Q. 29. Do you recall of your own knowledge whether the cable you have referred to was arranged to raise or lower the first section of chute?

A. I couldn't say positively, but I think it was.

Q. 30. Please read your answer to Q. 21 and state whether the last word is correctly written?

A. That is what I mean. They run the concrete through the chutes as far as they possibly could, and then dumped it into the wheelbarrows.

Q. 31. Then, as I understand it, this last word should be plural and not singular; is that correct?

A. Yes.

Q. 32. Were you employed on this building during the entire time it was being built?

A. No.

Q. 33. Where were you the rest of the time?

A. Off at college, Washington & Lee University.

Q. 34. What kind of a course were you studying at college?

A. Engineering.

Q. 35. About when did you see this Lynnhaven Hotel apparatus with reference to your college career?

A. During my vacation in the summer of 1906. I was in my third year at college.

Q. 36. About how late in the summer of 1906 did you see this apparatus?

A. Well, I worked on the hotel up to the time of the fall opening of the college, which was along about the 15th to 20th of September.

[fol. 200] Q. 37. And you saw these chutes you have referred to before you returned to college?

A. Yes.

Q. 38. Who got up this chuting rig you have been describing?

A. Well, from what I heard my father say, it was Arthur Smith who designed the durned thing.

Mr. Anderson: Answer objected to as being hearsay.

Q. 39. Did you ever meet this Arthur Smith?

A. Oh, yes.

Q. 40. What was his connection with the work?

A. General superintendent.

Q. 41. Do I understand that it was only through your father that you gathered that this was Smith's apparatus?

Mr. Anderson: Question objected to because witness has already stated that it was through his father that he understood that it was Smith's apparatus.

A. My father and myself discussed it, discussed it at home nights, and I think I recall him saying that Smith was a pretty smart man to rig that up.

Q. 42. Did you ever see Mr. Smith working in the vicinity of this apparatus?

A. Yes.

Q. 43. How do you fix the year 1906, rather than some other year, in your previous answers?

A. Well, it was the year before the exposition. My father was one of the big stockholders of this particular hotel, and he was very anxious to complete it so as to take care of the exposition crowd.

Q. 44. Have you ever been employed on other concrete buildings?

A. Yes. Was employed on this one first, the first one in Norfolk.

[fol. 201] Q. 45. Is your recollection of the details of this job any different from your recollection of other jobs you have been employed on?

Mr. Anderson: Objected to as leading and apparently as trying to indicate the answer desired.

A. What do you mean by details?

Q. 46. Aside from details, what would you say as to your recollection of the manner in which this building was built? Is it good, bad, or indifferent?

A. Well, the details of construction of every building are different, but I was employed on the building across the street from the Lynnhaven Hotel, known as the Vinery Building, now the Philip Levy Building, which was built by my father, and the principle of the construction was approximately the same.

Q. 47. I did not intend to ask so much about the details of construction as to this building as much as to the way you remembered it. Can you answer a little more fully in this regard?

Mr. Anderson: The question is objected to because it asks the witness for an opinion as to his own recollection or memory, and not as to facts.

A. From the point of construction, it was the same as the Lynnhaven, both being poured concrete construction, and the principles were practically the same.

Q. 48. About when was the Lynnhaven Hotel finished?

A. I should say in the spring of 1907.

Q. 49. Was there anything in connection with the finishing of this building that causes it to fix yourself in your memory?

A. Yes, as I said before, my father was one of the big stockholders in the building and they worked day and night to complete it on time.

Q. 50. Did you see this building about the time it was finished? [fol. 202] A. Yes, sir.

Q. 51. Will you kindly explain how you happened to be in Norfolk at that time?

A. Well, my father wrote me while I was off at college that his present financial condition was at that time very bad and the banks had refused to let him have more money, and told me I had better come home; and at some future date he hoped to send me back to college to finish my course and graduate. I came home in early 1907 and went to work again with him.

Q. 52. On what jobs were you employed when you came home?

A. Lynnhaven Hotel and the building across the street, the Vinery.

Q. 53. Referring again to the concrete chuting apparatus on the Lynnhaven Hotel, how was the gate operated?

A. It was raised and lowered by a laborer who stood on a platform and raised it as they needed the concrete, to let it go through the chute.

Q. 54. Who was your father's superintendent on the Vinery Building?

A. Arthur Smith looked after both those jobs.

Q. 55. Do you recall whether his full name was Arthur L. Smith?

A. Yes.

Q. 56. What apparatus did Smith use on the Vinery Building for distributing concrete?

A. Practically the same he used on the Lynnhaven.

Q. 57. About how many lengths of chute did you employ on the Vinery job?

A. I think it was two or three.

Q. 58. Can you describe briefly the size or height of the Vinery Building?

A. The Vinery Building is a two-story affair, with a small third floor facing Granby Street.

[fol. 203] Q. 59. What about its length?

A. It runs from street to street.

Q. 60. You mean about a block long?

A. It is a block long.

Q. 61. About where was the tower located on this Vinery Building?

A. Do you know where the present elevator is located now? That is practically in the center of the building.

Q. 62. About how far would you estimate that the concrete flowed through the chutes on the Vinery Building—as a maximum?

A. I should say fifty feet.

Q. 63. And in this case, were the individual chutes about the same length as on the Lynnhaven job?

A. I couldn't say positively, but I think they made some improvement on that chute on this building, because it was at a little later date. I am really inclined to think that they really shot it further on it than they did on the Lynnhaven.

Q. 64. When did you first meet Mr. Cyrus N. Anderson, the attorney who is present for plaintiffs in the room today.

A. Some time this past fall, I think.

Q. 65. What was the occasion for this meeting?

A. Mr. Anderson came over to my home to see me about the same thing you are asking me now.

Q. 66. You mean he asked you about this chuting apparatus of Arthur L. Smith's?

A. Yes.

Q. 67. What did you tell him?

A. I told him what I told you with the exception of the Vinery Building. I don't think he asked me anything about the Vinery.

Q. 68. On how many different occasions did you see him?

[fol. 204] A. Twice.

Q. 69. About how far apart were these visits?

A. Couple of months, I should say.

Q. 70. Did he ask you to sign any statement regarding your recollection of this apparatus?

A. No, sir.

Q. 71. Did he explain why he was making these inquiries?

A. I don't think he did. I don't recall asking him. It wasn't of any interest to me. It was ancient history so far as I was concerned.

Q. 72. As the Lynnhaven Hotel became higher, what was done with the hopper?

A. It was raised according to the construction. The higher the building, the higher the tower.

Q. 73. You mean both the tower became higher and the hopper was mounted in a higher position on the tower?

A. Yes.

Q. 74. Did you ever know Andrew J. Kerns, who lives in Richmond and who made an affidavit on August 23, 1920, in this suit?

A. Yes. Kerns was a labor foreman for my father.

Q. 75. Was he employed on the Lynnhaven Hotel job?

A. Yes. He had charge of a gang of niggers. My recollection of Kerns is he had charge of a gang of niggers keeping the structure clear of all forms and rubbish as they were taken off the concrete.

Q. 76. Was he employed steadily throughout the work?

A. I wouldn't say steadily any more than a labor foreman usually is on a construction job. He would come on the job some Monday mornings in not any too good shape; father would fire him and just as soon as he got straight again he would hire him over again, which he did with a lot of other men.

[fol. 205] Q. 77. Would you say he was qualified by education and experience to make a drawing of concrete hoisting and distributing apparatus

Mr. Anderson: Objected to as immaterial and irrelevant and also for the reason that there is no evidence in the case that Kerns has ever attempted to make such a drawing as is referred to.

A. From my experience with Kerns at that particular time I would say that his education was limited. I couldn't say whether he could make a drawing or not.

Q. 78. I call your attention to the sketch attached to Kerns' affidavit and will ask if the hopper shown therein is an accurate representation of the hopper on the Lynnhaven Hotel with respect to its shape and its location with reference to wheelbarrow and floor?

A. This hopper arrangement here is similar to the other with the exception that it doesn't show any trough or chute. What is this 5, a chute?

Q. 79. You state whatever you think the sketch represents to a man like yourself, who has studied engineering.

Note.—Witness examines the sketch several minutes.

A. I can't say what 5 is. That figure 5 looks to me like it should be in connection with figure 4 although figure 4 doesn't show the sketch complete.

Q. 80. Do you refer to numeral 4, when you say "figure 4"?

A. Yes.

Q. 81. I call your attention to Defendants' Exhibit 21, the drawing opposite page 42, and will ask if you have ever seen apparatus of that character in use, and if so, about how long?

A. This apparatus here is similar to the one we used in the construction of the building.

Q. 82. In what respect is it similar?

[fol. 206] A. The construction of the tower and the conveyor, also the bin.

Q. 83. Where did you get the concrete bin or hopper used on the Lynnhaven Hotel building?

A. It was a home-made affair built on the job.

Q. 84. Do you know who built it or had it built?

A. Smith, according to my recollection, had the whole thing built.

Q. 85. What I started to ask before was, whether apparatus of this general type has been used on buildings other than the Lynnhaven Hotel, and if so, for about how many years?

A. This apparatus here was used on numerous structures.

Q. 86. Do you know any of the following parties who have also filed affidavits on behalf of the plaintiffs in this case: Walter N. Thornton, Roland Brinkley, J. A. S. Goldbach, Wm. T. Baker?

A. Yes, I know all of them.

Q. 87. If any of them were connected with the Lynnhaven Hotel job, would their connection be such that they would have been directly concerned with the apparatus used there for distributing concrete?

A. Mr. Thornton was a plumbing contractor; Mr. Goldbach was an electrical contractor; Mr. Brinkley was my father's secretary; and Mr. Baker, he was general superintendent of the Botetourt's apartment. That was under construction at the same time the Lynnhaven was.

Q. 88. If these parties had occasion to visit the Lynnhaven building during its erection, would they have been more concerned with the uppermost floor of the construction than with any of the others?

Mr. Anderson: Objected to as calling for the opinion of the witness.

A. Mr. Brinkley never had occasion, I don't think, to visit the con- [fol. 207] struction only on Saturdays, paydays, and Mr. Baker, I don't think he had time to get down there. As far as the others are concerned I couldn't state, but personally I took an interest in the construction, hoping one of these days to get in the contracting business myself.

Q. 89. Have you any photographs showing this Lynnhaven building under construction, or the Vinery building?

A. No, sir.

Q. 90. Have you ever had occasion to look through your father's records?

A. Yes. Some years ago I wanted to look up some records, but I was never successful in finding them.

Q. 91. Was there no photographer employed by your father to photograph these buildings?

A. He had pictures taken during the construction for advertising purposes.

Q. 92. Have you asked the photographer if he could find any such pictures of the Lynnhaven Hotel?

A. Yes.

Q. 93. When did you ask him, and what did he find?

A. I asked him today and he said he couldn't find any.

Close of direct examination.

Cross-examination by Mr. Anderson:

X Q. 94. What time did you begin your work as timekeeper on the Lynnhaven building, now known as the Southland Hotel?

A. In the summer of 1906.

X Q. 95. About how early in the summer of 1906?

A. I couldn't say positively; about the middle of the summer, I think.

X Q. 96. Would you say July or August?

[fol. 208] A. It was one or the other.

X Q. 97. But you don't remember which?

A. Don't remember which month, no, sir.

X Q. 98. About how late was it in September that you left to go to college for the session of 1906-1907?

A. Between the 15th and 20th of September.

X Q. 99. When was it that you next worked on that building?

A. I should say about the following February, in 1907.

X Q. 100. Just what were your duties as timekeeper in 1906?

A. Keeping the records of the men's time and their duties so as to give it to my father's secretary every Thursday.

X Q. 101. Did you have an office down at the Lynnhaven Building while it was being constructed?

A. Yes.

X Q. 102. Just where was your office?

A. Where the photograph shows it, on the corner of Freemason and Granby.

X Q. 103. I mean your own particular office, where was it with respect to the building at the corner of Freemason and Granby Streets?

A. The particular office was on Granby Street on the northeast corner of the hotel.

X Q. 104. On the first floor?

A. It was raised up so that the people could walk under it on the first floor.

X Q. 105. Just tell us how you got the time for the men who were working on the job?

A. I went around the building and checked up the names and the numbers.

X Q. 106. You mean you went from place to place in the building, as it progressed?

A. Yes.

[fol. 209] X Q. 107. How often did you do that?

A. On an average of four times a day.

X Q. 108. How far along was the construction of this building at the time you left for college which you have testified was in September, 1906?

A. I think it was around the third floor. I think the third floor form was set.

X Q. 109. Do you remember about how far along the building was

when they began to use the trough to which you have testified, for distributing the concrete?

A. No.

X Q. 110. Is it your recollection that they were using the trough to distribute the concrete when you first went to work as timekeeper?

A. I couldn't say positively, because I didn't get around the building for the first two or three weeks while I was there. I was looking after the—I was in the office on the job there studying the details trying to learn something about construction.

X Q. 111. Was that while you were timekeeper?

A. Yes.

X Q. 112. Then, for the first two or three weeks after you became timekeeper you went up on the building very little. Is that correct?

A. Yes.

X Q. 113. Then it wasn't necessary for you to go up on the building in order to get the time of the men?

A. Yes, it was. My father had a timekeeper on the job when I went on it and I got my records from him up until the time of his dismissal.

X Q. 114. Then you weren't actually timekeeper at first, were you?

A. Yes, I turned in all the records to the secretary once a week so he could make up the payrolls.

X Q. 115. During the first two or three weeks after you went on [fol. 210] the building as timekeeper, did you or the other man get the time of the men?

A. Both, both, but he made more frequent visits at that time than I did.

X Q. 116. In your answer to X Q. 110 you say that you didn't get around the building for the first two or three weeks while you were there, then it was only the last two or three weeks of your period there in 1906 that you got around the building. Is that correct?

A. I shouldn't say that. My impression is I was on the building about two months during my vacation; that is my impression of it.

X Q. 117. I think you said in your direct testimony that you saw me twice some time last fall, did you not?

A. I wouldn't say fall; summer or fall. I know I came off my vacation in July. It was some time after that, but the exact date I don't remember.

X Q. 118. I think you said also, did you not, that it was about two months between my first visit and my second visit?

A. I said it was some time about two months, but I never paid any attention to the time. This matter never interested me, so I never paid any attention to it.

X Q. 119. How long was it after I saw you that somebody else came around and talked with you about this matter?

A. Four or five months, I guess.

X Q. 120. When was it that somebody came around to see you about this matter, that is somebody besides myself?

A. Some time before Christmas.

X Q. 120. Who was it?

A. Mr. Smith.

X Q. 121. What did Mr. Smith say to you about this matter that you have been testifying about today?

[fol. 211] A. He asked me did I have a recollection of his chutes.

X Q. 122. Is that the first question he asked you?

A. I couldn't say that. I would say no, it wasn't the first question he asked me. Mr. Smith and myself hadn't seen each other for quite a number of years, and the first question he asked me was how my family was getting along, how we were getting along and how everything was getting along—just discussing old times.

X Q. 123. You mean Arthur L. Smith, do you not?

A. Yes.

X Q. 124. When he first asked you about your recollection as to the use of chutes on this building, what did you say to him?

A. I told him I did recollect him using chutes.

X Q. 125. What else did you say about it?

A. He asked me to give him my impression of how I recollected it and I told him.

X Q. 126. You told me what he said to you; what I want is what you said to him?

A. I told him practically the same thing that I said before in this investigation or whatever you call it.

X Q. 127. Do you mean that when he first spoke to you about it that you told him that you remembered the use of chutes and also the use of a cable to support the outer end of the first chute?

A. He asked me to describe it, to describe my recollection of the way the concrete was distributed.

X Q. 128. Would you mind repeating just as nearly as you can now that description that you gave him?

A. The description I gave Mr. Smith was that the concrete was hoisted in a conveyor to the distance required and dumped into a bin which bin had a gate operated by a laborer to let the concrete flow through the chute.

[fol. 212] X Q. 129. And that was all you said to him?

A. No.

X Q. 130. Go ahead and give us the rest.

A. He asked me, would I recognize some pictures, and I told him I didn't know. He showed me the pictures and I did recognize them.

X Q. 131. Was that all you said to him about the distribution of concrete by chutes?

A. I think that is all he asked me.

X Q. 132. That is all you can recall that you told him?

A. Yes, that is all I can recall.

X Q. 133. Then you didn't remember at that time about the use of the cable, did you?

A. Yes, I just explained that to you.

X Q. 134. No, in repeating what you said to Mr. Smith, you didn't say anything about the cable. Is it not a fact that Mr. Smith told you that he used a cable to support the outer end of the first chute and you agreed with him?

A. I can't recollect Smith telling me any such thing as that

X Q. 135. Do you recall why it was that at neither of the interviews which I had with you you said nothing about the use of a cable to support a chute?

A. I don't recall you asking me any such question.

X Q. 136. Do you recall that I asked you to tell me all you remembered about how the concrete was distributed?

A. I do and I think I told you just exactly what I said.

X Q. 137. Don't you remember that when I showed you the affidavit of Arthur L. Smith which was filed in this case on or about the 9th day of August, 1920, and called your attention to the photograph and pencil sketch attached thereto, that you stated that you [fol. 213] had a faint recollection that Mr. Smith used a trough of some kind, but you couldn't remember anything about it?

A. I recollect you showing me these papers with the sketch and a photograph. I don't recall saying I didn't know anything about it.

X Q. 138. You now have in your hand the affidavit of Arthur L. Smith, to which I have just referred. Do you recall that I showed you that affidavit with the sketch and photograph attached on both occasions when I visited you?

A. Yes, I recall you showing me these papers.

X Q. 139. Can you recall whether or not there was anyone with me when I showed them to you, and if so, who was it.

A. I don't recall, Mr. Anderson, whether it was your first or second visit that you showed me those papers. I know on your first visit you were alone. On your second visit you had Kerns with you.

X Q. 140. Do you mean Andrew J. Kerns?

A. Yes, sir.

X Q. 141. The same man to whom you previously referred in your testimony. Is that not so?

A. Yes, sir.

X Q. 142. Do you recall whether I showed you this affidavit of Smith's at the time Mr. Kerns and I were at your house, and when you were interviewed in regard to this matter?

A. I don't recall whether it was on the first or second visit when those papers were shown me.

X Q. 143. What is your recollection as to the way in which the upper end of the trough 4 shown in Defendants' Exhibit 20 was connected to the lower end of the hopper 3?

A. I don't recall exactly how it was connected. It was con- [fol. 214] nected in some sort of way that you could swing it around, that *it* the best of my recollection of it.

X Q. 144. Are you sure it was connected at all? Are you willing to swear it was connected at all?

A. It had to be connected in some sort of way to keep from spilling the concrete, but as to the details I don't remember.

X Q. 145. Wasn't it supported on horses or benches all together?

A. No, sir.

X Q. 146. Did you assist in any way with the work in connection

with the operation of the chutes or with releasing the concrete from the hopper?

A. No.

X Q. 147. You had nothing to do whatever with that work, did you?

A. No.

X Q. 148. All you did was to look after the time of the men?

A. No, I looked after assisting in moving the sand and gravel to keep things moving.

X Q. 149. Where were you moving the sand and gravel to?

A. Moving it to the building.

X Q. 150. You mean to the concrete mixer at the base of the tower or hoist?

A. Yes, sir.

X Q. 151. How much of your time did that take?

A. Oh, I had a bicycle and I rode up and down the street to keep the teams from loafing; they only had a short haul.

X Q. 152. Did you spend most of your time at that?

A. No, sir.

X Q. 153. Where did the workman who operated the gate at the lower end of the concrete hopper, stand?

[fol. 215] A. He stood on a platform by the gate.

X Q. 154. How high was that platform from the floor?

A. I should say 14 or 16 feet.

X Q. 155. Is this photograph Defendants' Exhibit No. 19' like the one that Arthur L. Smith showed you when he came to see you some time ago?

A. Yes.

X Q. 156. Does that photograph show any of the troughs to which you have been referring?

A. No.

X Q. 157. Is it your recollection that the upper end of the trough 4 shown in Defendants' Exhibit 20 was connected directly to the hopper 3?

A. Yes. My recollection is the trough was connected on to the hopper.

X Q. 158. You don't recall any short spout in between the upper end of the trough 4 and the hopper 3, do you?

A. No.

X Q. 159. Describe your recollection of just how the upper end of the trough 4 was connected with the hopper.

A. I can't do it. I don't recollect exactly how it was connected.

X Q. 160. Do you remember whether it was rigidly connected to it?

A. No, I don't know whether it was rigidly connected to it or not. I know it was connected on in such a way that you could swing it around. As to the details of the connection, however, I don't remember.

X Q. 161. You never saw it swung around, did you?

A. Yes, sir, saw it moved in different positions.

X Q. 162. What is your recollection as to how high the building was when you returned in February, 1907?

A. I think they were pouring the roof.

[fol. 216] X Q. 163. And you were not employed on the building from the time you left to go to college in September, 1906, when you have stated the building was up to the third floor, until it was up to the roof. Is that correct?

A. Yes.

X Q. 164. Did Mr. Smith tell you that the upper trough 4 as shown in Defendants' Exhibit 20 was connected to the hopper so that it could be swung around?

A. Mr. Smith didn't tell me anything.

X Q. 165. Just what did Mr. Smith say to you about this construction when he saw you some time ago?

A. No more than I have previously said.

X Q. 166. I don't recall what you have testified that Mr. Smith said about this structure. Will you please state now just what Mr. Smith said to you about this construction?

A. Mr. Smith asked me, did I remember how the concrete was distributed on this building. I told him I did.

X Q. 167. And that is all he said to you about it?

A. No, he asked me would I give him an affidavit as to what I remembered, and I told him I would.

X Q. 168. You mean that during the whole time of his conversation with you, he said nothing about what the construction was?

A. Mr. Smith asked me did I recollect as to how the concrete was placed and would I be able to recognize a photograph. Mr. Smith didn't tell me how it was placed.

X Q. 169. He didn't mention to you while he was talking to you about this matter that the upper end of the first trough was connected with the hopper so it could be swung around, did he?

A. No, I have seen the thing swing around. He didn't tell me how it was connected, because I don't remember.

[fol. 217] X Q. 170. Then you have no idea as to how the connection between the upper end of the first chute and the hopper was made?

A. No, sir, I don't recollect how it was connected.

X Q. 171. Is it your recollection that all of the concrete which was placed in between the outer end of the first chute as shown on Exhibit No. 20 and the tower 1, was by means of the chutes?

A. I don't remember.

X Q. 172. Do you remember whether any of the concrete adjacent and near the tower was conveyed by wheelbarrows?

A. Yes, it was conveyed by wheelbarrows; it was conveyed by the chute also.

X Q. 173. I understood you to say in your direct examination that the concrete in the position I have just described was placed by chutes. Which of your answers is correct?

Mr. Jones: Counsel is requested to show the witness the statement referred to.

I am referring to your answer to question 23.

A. Both of them are correct.

X Q. 174. Just what do you mean?

A. I mean he shot his concrete around the tower where it was most convenient with the chute, and where it wasn't convenient he would place it in a wheelbarrow.

X Q. 175. When he placed it by means of a wheelbarrow, was the concrete discharged from the hopper right into a wheelbarrow?

A. No, sir, the hopper was too high up.

X Q. 176. How close, according to your recollection, was the upper end of the first chute to the lower end of the hopper?

A. Right close up to it, close as it could get to it.

X Q. 177. Jammed right up against it.

[fol. 218] A. I shouldn't say it was jammed, it might have been at that, but it remained so that you could move it.

X Q. 178. You never helped to move it, did you?

A. No, sir.

X Q. 179. Is it your recollection that cables were used to support the outer end of the first chute which you testified was used on the Vinery Building?

A. Yes.

X Q. 180. Is your recollection distinct and definite as to that?

A. My recollection is that the method of distributing the concrete was the same on both buildings.

X Q. 181. And it is your recollection that more than three trough lengths were used in distributing the concrete on the Vinery Building?

A. No, my recollection isn't that they used more than three troughs.

X Q. 182. Well, what is your recollection?

A. My recollection is that they used a longer trough on the Vinery Building than they did on the Lynnhaven.

X Q. 183. Who do you think would know more about that, you or Mr. Arthur L. Smith?

A. Personally I should think I would know more about it; Mr. Smith wasn't there during the entire time of the construction.

X Q. 184. Was Mr. Smith superintendent of construction of that building?

A. He was for a while.

X Q. 185. Did he leave your father's employ before that building was finished?

A. Yes.

X Q. 186. Who was superintendent after he left?

A. That was at the time my father went into bankruptcy and the building wasn't completed.

X Q. 187. Wasn't Mr. Smith there until your father went into bankruptcy?

[fol. 219] A. I think he was.

X Q. 188. What did he have to do with the building after that time?

A. He assisted my father in the construction of it.

X Q. 189. Do you mean that your father completed the building after he went into bankruptcy?

A. Yes, sir.

X Q. 190. What did you mean in your answer to X Q. 186, when you said that your father "went into bankruptcy and the building wasn't completed?"

A. The building wasn't completed until some years after that.

X. Q. 191. How far along was the Vinery Building when your father went into bankruptcy?

A. Pouring the roof for the second floor; I think that is where it was.

X Q. 192. How many stories has this building?

A. This building has got—it was just as it stands now, the building was designed for 8 or 10-story construction, but on account of my father's failure it never was completed.

X Q. 193. I understand it is now a two-story building. Is that correct?

A. Yes, that is correct.

X Q. 194. Then when your father went into bankruptcy and Mr. Smith discontinued work on that building, practically all of the concrete had been poured, had it not?

A. No, I shouldn't say all of it. During the bankruptcy proceedings the job held fire for a certain period until the receivers could issue and negotiate certificates to complete the building. My father didn't know how long a period that would be and Mr. Smith accepted a better position or another position, I don't know which.

X Q. 195. What proportion of the concrete remained to be poured at that time?

[fol. 220] A. I think there was the third floor front.

X Q. 196. You said awhile ago, I thought, that it was a two-story building.

A. I didn't say the entire structure was two stories.

X Q. 197. After your work on the Vinery Building, when did you next work upon a building or other structure in which concrete was being used?

A. I think it was the Dickson Building. That was a different type of construction altogether. That was a steel frame construction instead of a concrete. It had concrete floors.

X Q. 198. Where was that building located?

A. Granby and Tazewell Streets, Norfolk, Va.

X Q. 199. How long was it that you worked on that building after you worked on the Vinery Building?

A. I think we started that building in 1908.

X Q. 200. How was the concrete placed, by wheelbarrows or chutes?

A. Both.

X Q. 201. Were the chutes stationary or could they be moved about?

A. They were movable.

X Q. 202. How were they supported, do you remember?

A. I think we had them supported on the same principle as we did the others. Only we could only use a short chute in that construction and had to do most of our work by wheelbarrows, as the steel frame was up to its roof before we could pour any concrete and the beams interfered with our using a long chute.

X Q. 203. You mean you used a single short chute?

A. Yes.

X Q. 204. And is it your recollection that it could be swung from side to side?

A. You could swing it as far as possible but you couldn't swing [fol. 221] it very far on account of the beams. As I said before we had to do most of it and did most of it by barrows.

X Q. 205. Have you had much experience since that time in which concrete was distributed and placed by means of lateral swinging chutes?

A. Yes, I have had some experience in that line.

X Q. 206. When was your last experience of that kind?

A. Well, the beginning of the war I was an inspector of building a drydock at the navy yard, and the government found they could use me to better advantage at other work and they put me on other inspection work. But I say, I have come in contact daily with concrete construction being distributed by chutes.

X Q. 207. Can those chutes be swung laterally?

A. Yes, sir.

X Q. 208. Such construction is quite common now, isn't it?

A. Yes, sir, it is much more modern.

X Q. 209. When the matter of the way in which the concrete was distributed on the Lynnhaven Hotel Building and the Vinery Building was first called to your attention by me, wasn't that the first time that you had thought about the same for years?

A. No, sir, it wasn't the first time I had thought of it. I had often thought of it in noticing the improvements that had been made.

X Q. 210. Just what improvements do you refer to there?

A. I mean in the olden days when building the Lynnhaven Hotel that they had built a wooden tower and we could only chute the concrete forty or fifty feet; nowadays they build steel towers and chute it four or five hundred feet.

X Q. 211. Are those the only improvements that you can think [fol. 222] of that have taken place, in the manner of distributing concrete, within the last thirteen or fourteen years?

A. No, sir, they are not. The most modern plants nowadays practically eliminate the wheelbarrow distribution, and when we used it we had to use both.

X Q. 212. As a matter of fact, are you sure that you are not mistaken and that you are not thinking of the latter day and present day practice of swinging the chutes laterally when you say that the first chute on the Lynnhaven Building and the Vinery Building could be swung laterally?

A. I am pretty positive that it could be swung laterally because

it would be practically useless to swing it in one position; too much expense.

X Q. 213. Your duties on the Lynnhaven Building did not require you to have anything whatever to do with the chutes and with the distribution of the concrete, did they?

A. No, sir, my duties on the Lynnhaven Hotel were to save the expense of the timekeeper and more to get the practical experience than anything else, as I was studying engineering at the time.

X Q. 214. What branch of engineering?

A. Mechanical.

X Q. 215. How often each day did you go up on the building when you were timekeeper in 1906?

A. I went up there I should say twice in the morning and twice in the afternoon on the average.

X Q. 216. Did you do that every day during the period of your employment by your father in connection with the work on that building during the year 1906?

A. So far as I remember, I did.

X Q. 217. How old were you in September, 1906?

A. I am thirty-five now and 1906 is 14 years from 35 makes me [fol. 223] 20 years old I should say. I will be 35 two months from now.

X Q. 218. Was your father in the habit at that time of conferring and consulting with you about his building operations?

A. Yes.

X Q. 219. In the course of your direct testimony you say that you saw Mr. Smith in the vicinity of the concrete distributing apparatus on the Lynnhaven Building. How often did you see him in that particular location?

A. All times during the day, he was here, there and everywhere.

X Q. 220. Did you see him up there each time that you went up on the building?

A. No, sir.

X Q. 221. According to your recollection, how long was Andrew J. Kerns employed on the Lynnhaven Hotel Building?

A. I couldn't say. He was there when I came on the job in 1906, and he was there off and on I should say until its completion, I guess. I don't know whether he stayed there until the job was completed or not.

X Q. 222. Was he there when you returned in February, 1907?

A. I think he was.

X Q. 223. Did he work on the Vinery Building?

A. I don't know whether he did or not.

X Q. 224. Will you describe a little bit more definitely your recollection as to what Kerns did or what his duties were on the Lynnhaven Building?

A. My recollection of Kerns' duties was that he had a gang of niggers moving the forms from the concrete and keeping the building in general clean, keeping the plaster off the doors.

X Q. 225. Wasn't he foreman of the concrete work?

[fol. 224] A. Not to my knowledge on this particular structure.

X Q. 226. Well, on what other structure was he foreman of concrete work?

A. I don't know that he was ever foreman of a concrete gang, although I have seen Kerns on numerous occasions standing around the mixer directing the laborers wheeling the sand and gravel.

X Q. 227. You remember seeing him around on the floor on which the concrete was being distributed in the Lynnhaven Building?

A. I don't remember seeing him up on the structure itself, but I have seen him around the mixer, as I said before, and inside the building removing the forms.

X Q. 228. Where were the forms which he was moving?

A. Off the columns and walls that had been poured.

X Q. 229. Didn't you see him up on the floors when he was attending to this work?

A. Yes.

X Q. 230. If troughs were used for distributing the concrete as you have testified, is there any reason why he shouldn't have seen them and been familiar with them?

A. No, there was no reason why he shouldn't have seen them. They were there for anybody to see, but unless he took an interest in the construction I don't suppose he paid any attention to it.

X Q. 231. In your answer to Q. 76, you say that Kerns "would come on the job some Monday mornings in not any too good shape." What was the trouble with him?

A. Kerns was in the habit of drinking, which I don't suppose he will deny.

X Q. 232. Then I suppose you mean that he came on the job with a "hang-over"?

A. Yes, sir.

X Q. 233. On these occasions, about how long is it your recollection that Mr. Kearns would be off the job?

[fol. 225] A. That is hard to tell; sometimes it would be two or three days.

X Q. 234. Do you know Mr. Wm. P. Baker?

A. Yes, sir.

X Q. 235. He has the reputation of being a reliable and trustworthy man, has he not?

A. Yes, sir.

X Q. 236. You have stated that it was some two months between the time that you first saw me, either in the summer or the fall of last year, and the second time that you saw me. Do you regard the other statements which you have made today on recollection as being as accurate or more accurate than your recollection as to the time between my visits?

Mr. Jones: Objected to as immaterial.

A. I never made any note as to the time. I said I thought it was about two months. It might have been more and it might have been less. I didn't pay any attention to it.

X Q. 237. Who was the photographer that you saw today?

A. Mr. Faber.

X Q. 238. You said during your direct examination that Mr. Arthur L. Smith had the hopper or bin built. How do you know he had it built?

A. While I was on the job my father and myself used to discuss the construction of the building nearly every night at home. I recall I asked him where he got his idea from and I think he told me it was some of Smith's work.

X Q. 239. How long was it after you went to work on the Lynnhaven Building in 1906, before, according to your recollection, the troughs were put into use?

A. I don't know; I think they were in use when I came there.

[fol. 226] X Q. 240. Have you any distinct recollection of seeing the trough when you first went to work as timekeeper on that building?

A. When I first went to work as timekeeper on the Lynnhaven, I didn't go into the structure for a couple of weeks.

Cross-examination closed.

Redirect examination by Mr. Jones:

R. D. Q. 241. Did you ever see Robert D. Preston on the Lynnhaven Hotel Building?

A. Yes, sir.

R. D. Q. 242. Do you recall about how long you saw him on the job before you went back to college in 1906?

A. He was there when I came there, a couple of months I should say.

R. D. Q. 243. Preston stated that he first came on the job early in September, 1906. What can you say as to this?

A. I can't say, but my recollection is that Mr. Preston was there when I came there.

R. D. Q. 244. Do you think you are mistaken or he is mistaken?

A. I am inclined to think Mr. Preston is mistaken, for this reason; he lived only a block away from the work and I think I used to go home with him in the afternoons, as I went up to see a young lady that lived right near by there.

R. D. Q. 245. Did you come home for a visit any time between September, 1906, and the late winter about February, 1907, when you left college?

A. I came home for a short while during the Christmas holidays.

R. D. Q. 246. Did you inspect the buildings at this time?

A. No, sir, I did not.

[fol. 227] R. D. Q. 247. Did you come home Thanksgiving?

A. No, sir.

R. D. Q. 248. Do you mean you may or may not, you don't remember?

A I don't recall coming home Thanksgiving.

R. D. Q. 249. Please look at your answer to X Q. 126, and state if you are referring to this deposition.

A. Yes.

R. D. Q. 250. Was Smith's apparatus successful as used on the Lynnhaven and Vinery Buildings?

A. They were successful—the apparatus was successful at that time, but of course the use of it was limited. What I mean by that, you could not chute it over forty or fifty feet, if you call that successful.

R. D. Q. 251. What I want to know is, was it successful in what it did, regardless of the distance reached?

A. It was successful for the purpose it was used.

R. D. Q. 252. You have referred to a man standing on an elevated platform. On what was the platform supported?

A. It was supported on a brace from the tower or a brace from the floor I don't know which.

R. D. Q. 253. Please explain your answer to Q. 61.

A. The tower for the concrete was where the present elevator is now.

R. D. Q. 254. How was the chute supported so that it could swing as you stated in X Q. 204?

A. Supported by a pulley fastened on the end of the tower and fastened on the end of the chute.

R. D. Q. 255. Do you mean there was a rope connecting these pulleys?

A. Yes.

R. D. Q. 256. Please make a rough sketch indicating the floor plan of the Lynnhaven Hotel.

A. I have done so on a letterhead of the old Lynnhaven Hotel, [fol. 228] which is now the Southland. The picture of the Lynnhaven Hotel is in the upper left-hand corner, showing entrances on Granby and Freemason Streets, the main entrance being on Granby Street.

Mr. Jones: The notary is requested to mark this sheet Defendants' Exhibit 23, Tatterson Sketch.

R. D. Q. 257. You referred to modern chutes extending four to five hundred feet. How are such chutes supported?

A. By a series of cables.

R. D. Q. 258. How suspended?

A. From a tower at a great height, and a catenary suspension.

R. D. Q. 259. How long would a man in Mr. Smith's position be confined to one job of the size of the Lynnhaven Hotel for example? In other words, about how long does a modern building take to erect?

Mr. Anderson: Objected to as immaterial. The only thing in which we are interested here is how long it took to construct the Lynnhaven Building.

A. I should say nine months.

Recross-examination by Mr. Anderson:

R. X Q. 260. My recollection is that you have testified that you went back to work on the Lynnhaven Building in February, 1907, when you returned from college; is that correct?

A. Yes.

R. X Q. 261. Were they using the troughs then for distributing the concrete?

A. I don't think so, I think the building was pretty nearly completed so far as the concrete was concerned.

R. X Q. 262. Were the troughs in place at that time?

A. I don't think they were.

Deposition closed.

[fol. 229] January 19, 1921.

Met pursuant to adjournment at the office of Rebecca Bauer, 310 First National Bank Building, Cincinnati, Ohio.

Present: Arthur M. Hood, for plaintiffs; George Bayard Jones for defendants.

ALBERT E. CULP, another witness produced on behalf of defendants, being first duly sworn, testifies as follows:

Q. 1. Please state your name, age, residence and occupation.

A. Albert E. Culp; 55; live at 4221 Grove Avenue, South Norwood, Ohio; superintendent for the Ferro Concrete Construction Company.

Q. 2. Please explain the nature and extent of the business of this company.

A. They do general construction work, that is, meaning concrete work, concrete, brick work and various other branches. They do business on a very large scale.

Q. 3. In what different cities have you carried on your operations?

A. In the east, Rochester, New York; and in the south, Memphis, Tenn., Clarksville, Tenn. In fact, I can't remember all the cities they do business in, because there are so many of them.

Q. 4. Please state your own past experience and training.

A. I started in this business to learn the carpenter trade and that's what led up to this business. I have been in this business for about 36 years. George B. Mueller, contractors, Cincinnati; afterwards was in business for myself at Denver, Colorado. Afterwards with Ransome Concrete Company and then with the Cincinnati [fol. 230] Fireproofing Company, who afterwards changed their name to the Ferro Concrete Construction Company. I have been with this company for the past 20 years.

Q. 5. What Ransome do you refer to?

A. It was a company composed of Mr. Bliss of Columbus, Ohio, and Mr. Lyons of Dayton, Ohio, and Mr. Kennedy, Cincinnati. These men I mentioned organized this company and I am under the impression that Ransome allowed them to use his name. Ran-

some—I understand from others, was an engineer contractor in the east. I never met Mr. Ransome.

Q. 6. Is he the Ransome whose name appears on Defendant's Exhibit 21?

By Mr. Hood: Objected to as incompetent.

A. I couldn't say because I don't know the man—never met him.

Q. 7. Is the name Ransome well known or otherwise in the concrete world?

A. It naturally is. He is one of the pioneers.

Q. 8. Did you have anything to do with the construction of the Ingalls Building here in Cincinnati?

A. I did from the first floor until it was completed.

Q. 9. What type of building construction was it; state what you had to do with it?

A. Reinforced concrete; I was superintendent just of that branch of the work.

Q. 10. Was there anything unusual about this building?

A. Very unusual. It was the first reinforced concrete building that was ever built in Cincinnati.

Q. 11. About when was it built?

A. To the best of my knowledge in 1902 and 3.

Q. 12. What apparatus was used for distributing the concrete on the different floors of this building?

[fol. 231] A. On the second floor we used a spouting system; the concrete was elevated in a concrete hoist to the various floors and discharged from the mixer into a concrete bucket which was elevated and then discharged into a concrete hopper and then distributed from that point to various parts of the floor.

Q. 13. How was it distributed on floors other than the second?

A. Discharged into wheelbarrows and wheeled to the various parts of the building.

Q. 14. Can you produce or point out from the exhibits before you, any photograph of this building? I show you Defendants' Exhibits 5, 6 and 10, and ask if you can identify them?

A. I do. On this Exhibit 6 I am on the lower left-hand corner.

Q. 15. You mean that is your photograh?

A. Yes.

Q. 16. What distributing apparatus do these photographs represent?

A. They represent part of the concrete hoist. Also the receiving hopper, and several sections of the spouting system.

Q. 17. Can you identify Defendants' Exhibit 7?

A. I certainly do. It is a photo of the building up to the second floor, or Exhibit 5. I refer to figure No. 14, Ingalls Concrete Steel Office Building during erection.

Q. 18. How many sections of chute are shown in Exhibit 5?

A. Approximately three.

Q. 19. Where is the concrete being deposited in that exhibit?

A. Over the front entrance door, which is located on Fourth St.

Q. 20. What is the other street?

[fol. 232] A. Vine Street.

Q. 21. Aside from your memory, is there anything in the photograph to help locate the building?

A. The old Pike Opera House directly south of it.

Q. 22. Is the opera house still there?

A. It is not. It was completely burned down during the operations on the second floor of the Ingalls Building.

Q. 23. When you wish to distribute the concrete to some point other than over the front entrance, what would you do?

A. Move them around by hand. Move the chutes.

Q. 24. How would you do this?

A. By hand with a few men.

Q. 25. On what were the chutes supported?

A. On a trestle or a cross arm.

Q. 26. About how many of them were there?

A. One to every ten-foot section.

Q. 27. Of what were these sections made?

A. Made of a black metal, or steel.

Q. 28. About how many of these chutes did you have on this second floor work?

A. Approximately ten or more.

Q. 29. How many of them did you use at one time?

A. About the same number.

Q. 30. In the photograph in the Engineering News, Exhibit 7, approximately three sections are shown according to your previous answers. What do you mean by your last answer?

A. I used ten or twelve of these sections which were about ten feet long to a section.

Q. 31. I mean did you always use all of them?

A. I did not. It all depended upon the distance we were chuting this concrete.

Q. 32. About what proportion of the total floor area was reached by these chutes in depositing the concrete?

[fol. 233] A. About 75 feet.

Q. 33. My question called for area.

A. Well, about 2,500 square feet.

Q. 34. What I meant was, did you reach a quarter of it, a half of it, three-fourths or what proportion?

A. The entire area was 5,000 feet, for this floor.

Q. 35. In other words, you deposited about half the concrete on this floor by means of the chutes, is that correct?

A. Yes, in one operation.

Q. 36. How was the other half deposited?

A. In the same manner.

Q. 37. Please explain what you mean by one operation.

A. We poured the entire floor in two operations.

Q. 38. I don't quite understand what marked the intervals between the two operations. Do you mean you would only have to move the chutes once?

A. Why, during this operation we were just as apt to move the chutes a dozen times or more.

Q. 40. What were the approximate dimensions of the floor area and how high was the building?

A. 50 x 100—sixteen stories high, all of which were of reinforced concrete.

Q. 41. Please trace the progress of the concrete from the mixer to its final place of deposit.

A. From the basement to the second floor and then to an elevated floor above the main entrance of the building.

Q. 42. Are you referring now to Exhibit 5?

A. I am.

Q. 43. You mean to say that the concrete would flow down the very flat slope of the chutes shown in this exhibit?

A. It did.

[fol. 234] Q. 44. Would the concrete that was ordinarily mixed on other jobs in 1902 flow down such a gentle slope?

A. Well, that's a question. That would be a question because at that time there was very few reinforced concrete buildings; however, there's no reason why this concrete shouldn't flow through these chutes if it was mixed properly with the right consistency of water.

Q. 45. What was the consistency of this concrete as compared with the standard practice of that period?

A. It was a wet concrete. It was wet concrete that we used for floor work; the column mix was much dryer.

Q. 46. For what purpose were the wheelbarrows used as shown in photograph D, Exhibit 10?

A. This was a column mix to be used in the columns.

Q. 47. Why did you not use chutes for dropping the concrete into the column forms?

A. They would not permit of it. The inspector for the owner and architects would not permit it because it was too wet of a mix for that purpose.

Q. 48. You mean it was not considered safe?

A. Well, it wasn't considered safe because at that time it required too long of a time to acquire its proper strength.

Q. 49. How do you deposit concrete in column forms today?

A. The work that is under my charge and some of our other work which I have seen, is done principally the same way as we done it at that time. I mean we use a chute and then wheel it and dump it into these column forms. The reason is that it is more economical. The company has a dozen and a half or so superintendents.

Q. 50. Do you recall the taking of any of these photographs?

A. I do.

Q. 51. Who took them?

[fol. 235] A. Yes. Charles H. Longley of Cincinnati.

It is hereby stipulated that opposing counsel interviewed Charles H. Longley, the photographer, this morning. It is further stipulated if said Longley were called as a witness he would testify that he took these photographs, Defendants' Exhibits 5, 6 and 10 in the winter of 1902-3, that he recalls the use of chutes during the early

part of the work on this building but not later, and that the said photographs are a correct representation of the structure and apparatus used at that time, and that the original plates have been broken.

Q. 52. Do you recall anything about the Engineering News article of July 30, 1903, Defendants' Exhibit 7?

A. Why, yes, I do. We had a copy of it in our office. I read the full particulars of the article.

Q. 53. What was done with the tower or hoist on this building as the building became higher?

A. Additional sections were put on it.

Q. 54. What was done with the hopper?

A. Removed from floor to floor.

Q. 55. How was the hopper supported?

A. On the tower and supports at the end of the hopper, resting on the floor forms, or on the concrete.

Q. 56. Was there any way of controlling the flow from the hopper to the upper chute section shown, for example, in Exhibit 6?

A. Yes, by a gate operated by a laborer.

Q. 57. Where did the laborer stand?

A. He would sit on a plank supported on this hopper.

Q. 58. At the time this building was built, were you familiar with the use of booms for any purpose?

A. Yes.

Q. 59. Is one shown in Exhibit 5?

A. Yes, there is. It is a boom on a stiff leg derrick.

[fol. 236] Q. 60. Who got up this chuting rig shown in this photograph?

A. Mr. Robert P. Anderson, vice president of the company, and myself.

Q. 62. Mr. Anderson, is he living?

A. He is not. He died about eight years ago.

Q. 63. After you finished pouring this second floor, what concrete distributing apparatus did you use on the remaining floors?

A. We used the same apparatus with the exception of a spouting system. We used wheelbarrows, or, in other words, it was a Ransome buggy, a two-wheel Ransome buggy, shown in Exhibit 10.

Q. 64. Are you the Albert E. Culp, who executed an affidavit in this suit August 5, 1920?

A. I am.

Q. 65. Have you read this affidavit recently?

A. I have.

Q. 66. Is it an accurate statement of facts relating to this building?

A. It is, except this apparatus was used two weeks instead of two months; Figure 1 of the sketch, the hopper in this sketch shows no support at the end.

Q. 67. You also state that this apparatus was suggested by Robert Anderson of your company; is that correct?

A. That's correct.

Q. 68. Why did you change to the wheelbarrows or buggies on the floors above the second floor?

A. We found it more economical.

Q. 69. Do you keep cost records of your various jobs?

A. Daily, and also weekly.

Q. 70. What are your present conclusions as to the relative economy of distribution by carts and by chutes under various conditions?

[fol. 237] A. That all depends upon the size of your building and also the yardage. It is principally the length of a building. We find it is more economical to wheel concrete than it is to chute it in many cases. It is a very costly proposition to put in a chuting system, and taking it out.

Q. 71. What effect, if any, did the floor area of the Ingalls Building have on your conclusions with reference to the use of wheelbarrows?

A. Why, as I said before, we found it more economical to wheel it than chute it.

Q. 72. Would you say the floor area of the Ingalls Building was large or small? From your standpoint?

A. Small, very small.

Q. 73. With the length of chute used on the second floor of the Ingalls Building, was any difficulty experienced in having the workmen carry the chutes around to different positions?

A. In a manner, yes.

Q. 74. What do you refer to?

A. In changing the positions.

Q. 75. You mean they were too heavy to be lifted?

A. No, they were changed so often.

Q. 76. How does the length of the upper section of chute or trough used in modern apparatus for spouting from a tower, compare with the length of the upper section of chute used by you in 1902 on the Ingalls Building?

A. Well, they are about from three to four hundred per cent. longer; the new apparatus.

Q. 77. Was your Ingalls Building chuting apparatus successful in use?

A. It certainly was.

Q. 78. Have you ever since used in your work chutes supported on horses or trestles?

A. We have.

[fol. 238] Q. 79. Are any of the original steel chutes used on the Ingalls Building still in existence?

A. One or two sections are at our warehouse. I have seen them recently.

By Mr. Jones: In view of the size and weight of these sections, they are not offered in evidence, but arrangements have been made for the opposing attorney to inspect them them if he so desires.

Q. 80. Do you know L. J. Mensch?

A. I know of him.

Q. 81. Do you know anything about him in connection with this building?

A. I do not.

Q. 82. Do you know where he was located at the time it was being built?

A. I do not.

Q. 83. Did you ever hear of his being in Cincinnati?

A. I understood he was at the time.

By Mr. Hood: Objection—all hearsay.

Q. 84. Was there any particular comment regarding the ingalls Building at the time or after it was built?

A. My understand of the matter was that the building inspector would not give them a permit to build this building. I was not in Cincinnati when this building was started and can't remember the various comments that were made at the time.

By Mr. Hood: The statement of the witness relative to the building inspector is objected to as hearsay.

Q. 85. How did this building compare in height with other reinforced concrete buildings previously built in the United States?

A. There were no other buildings ever built in the United States [fol. 239] of this character at that time, of entirely reinforced concrete construction.

Q. 86. A. I understand your previous answers, your decision to use wheelbarrows or carts on the floors above the second floor of the Ingalls Building, was based entirely on considerations of economy; is that correct?

By Mr. Hood: Objected to as leading.

A. That is correct.

Q. 87. What is the practice today with reference to the use of wet concrete as compared to the prevailing practice about 1902, for example?

A. At that time the engineers—concrete engineers of the United States were all in favor of a very dry mixture. Today it is just the reverse, with a medimum wet mix.

Q. 88. How did the mixture used on the Ingalls Building compare with the standard practice of that period?

A. There was so very little work done at that time that nobody knew. It was a difference of opinion between some of the leading concrete engineers and myself as to the mixture of this concrete whether it was to be a medium dry or a medium wet.

Q. 89. On large building jobs today, that is of large area, where chutes are used, how are they usually suspended?

A. They are suspended by—in some cases by a main chute line from one tower to the other and these chutes are suspended by ropes which supports the chutes. In other instances where the chutes are supported by poles from section to section, that is, where they don't use a main chute line. In some cases the first section of the chutes are supported by a boom resting on the concrete hoist.

[fol. 240] Q. 90. Were the Ingalls chutes closed pipes or open troughs of steel?

A. Open troughs.

Q. 91. Please make a rough sketch showing one arrangement of the chutes on the Ingalls Building, to illustrate the manner in which the concrete could be made to flow in the various directions?

A. I have done so.

Mr. Jones: The sketch is marked Defendants' Exhibit 24—Culp's Sketch.

Q. 92. In Exhibits 6 and 10, what are the objects that look like blocks or obstructions in the upper end of the upper chute?

A. It is a part of the side of the box—projection over the end.

Q. 93. Is it an obstruction?

A. It supports a small chute entering into the metal chute. In other words, these boards that project beyond the end of this hopper has never been cut off square with the hopper.

Q. 94. The question is, is it an obstruction?

A. It is not. It is just a little wooden snout that fits down into the upper end of the first metal chute.

Q. 95. In your sketch, Exhibit 24, you show the first section of chute projecting not exactly at a right angle from the hopper, but at a slight angle away from a right angle. What was the arrangement at the upper end of this upper chute that permitted this slight turning?

A. The arrangement of supporting this and turning this chute is by a piece of cable.

Q. 96. What is this apparent support which the upper end of the chute seems to overlap slightly in the picture?

A. It seems to be supported on the support that supports the hopper and this cable that supports this chute also holds this chute [fol. 241] in a position from slipping off of support referred to.

Q. 97. The "support that supports the hopper" is the vertical support you have previously referred to as supporting the outer end of the hopper; is that it?

A. That is it.

Q. 98. About how long would you say it took to place the reinforcing steel and pour the floor slabs for the second floor?

A. About five days.

Q. 99. About how long would it take including the pouring of the columns?

A. About 8 or 10 days.

Q. 100. In booms which you have seen used prior to 1905 or 6, for example, has the lower end of the boom always remained at a fixed height on its support?

A. Yes.

Q. 101. Have you ever seen booms secured to towers prior to that date?

A. I have.

Q. 102. And have you never seen an arrangement by which the lower end of the boom and hence the entire boom could be raised or lowered on the tower?

By Mr. Hood: Objected to as leading.

A. I have.

Q. 103. Do you know anything about the construction of the American Book Company's Building, Cincinnati?

A. I do.

By Mr. Hood: Objected to as relating to a structure not pleaded.

Q. 104. Do you recall how the concrete was placed on this building?

A. I certainly do, because I supervised that work from start to finish. We had a tower 65 feet high with a mast and boom on [fol. 242] top of same and hoist the concrete from the station which was in the basement by means of a large bottom drop bucket. It was distributed around the floors by means of this bucket and place in position.

Q. 105. Was it always dropped directly from the bucket into the forms?

By Mr. Hood: It is understood that the previous objection that the American Book Company Building has not been pleaded, shall be considered as entered, without repetition, to all questions and answers, relating to it.

A. Why, not in all cases. It dropped in a portable hopper and in some cases wheeled from there.

Recess.

Q. 106. You have referred to the expense of the modern equipment for distributing concrete. On what are your conclusions based?

A. Well, the extra expense of chuting concrete that you got to increase the height for your towers in order to give the chutes sufficient pitch so the concrete will flow. There are various other reasons that you've got to support and guy your towers, whereas, when you wheel your concrete these guys in the height of the towers are not necessary.

Q. 107. Was the American Book Company's building built before or after the Ingalls Building?

A. After. About three months.

Q. 108. You have referred to your familiarity with the use of booms. Have you ever personally used a boom on a tower which was also used for elevating concrete?

A. We have.

Q. 109. Was such instance prior to 1907?

[fol. 243] By Mr. Hood: Objected to as leading.

A. Yes, in 1905 we used it.

Q. 110. How was the concrete elevated in such cases?

A. The same as it is today.

Q. 111. You mean by a hoist bucket in the tower? Dumping into a hopper?

A. Yes.

Q. 112. What did you use the boom for in that case?

A. To hoist steel and form work.

Q. 113. Was it necessary to guy the tower in any way?

A. Guy is to use guy lines on it, but we just braced it or anchored it back to the building.

Q. 114. Were Ransome towers ever guyed by cables?

A. Never saw a Ransome hoist.

Q. 115. Where did you get your hoists?

A. We made them ourselves out of wood. But we used the Ransome buckets, and their hopper gates.

Q. 116. Do you know whether there was any discussion in your Company about applying for a patent on the apparatus which you say was worked out by Mr. Anderson and yourself for distributing concrete through a series of chutes on the Ingalls Building?

By Mr. Wood: Objected to as immaterial.

A. Not to my recollection.

Cross-examination by Mr. Hood:

Q. 1. Mr. Culp, in Plaintiff's Exhibit No. 10 there appears to be two pieces of 2 x 4 which are crossed upon themselves so as to form a crotch at their upper ends, and in this crotch the upper end of the first metal chute section is supported. That is right, isn't it?

A. That is correct, but in addition to this it looks as though from this photo that it takes an extra bearing on the 2 x 4 on the end of [fol. 244] the tower which supports the hopper.

Q. 2. You haven't any distinct recollection of this particular construction except as it is refreshed by the photograph you have testified from?

A. No, I have not.

Redirect examination by Mr. Jones:

Q. 1. As you had this apparatus constructed, was it the plan to have the upper end of the first chute supported so that its weight would be borne by the hopper?

By Mr. Hood: Objected to as leading.

A. Yes.

Q. 2. Then, as I understand your several answers, this upper end was supported in part by the rope and in part by the frames supporting the outer end of the hopper; is that correct?

A. Yes.

Q. 3. When you arranged two adjacent chutes at an angle to each other as shown in your sketch, Exhibit 24, how did you support the respective ends?

A. By a fork constructed out of 2 x 6 lumber and the chutes rest in this crotch on this support.

Q. 4. What prevented the concrete from over-chuting the trough and part of it spilling on the floor?

A. By means of a panel fastened to the side of the hopper which projected above the chute.

Q. 5. Do I understand from your answers to Qs. 35 and 36 as meaning that the entire second floor was poured by means of these chutes?

A. Yes.

Q. 6. And with the exception of the columns which were poured from wheelbarrows, all of the concrete flowed from the chutes on to the forms; is that correct? I refer to the second floor.

[fol. 245] A. Yes, that is correct.

Q. 7. When the concrete had been poured on all parts of the floor except near the tower, how many sections of chutes would you use in pouring the remaining area near the tower?

A. One section.

Q. 8. Do contractors and superintendents generally in positions similar to yours, have any financial interest in the outcome of this litigation?

By Mr. Hood: Objected to as incompetent.

A. Not as I know of.

Q. 9. What is the practice of contractors with reference to the cost of equipment of this general character as purchased today? I mean, who pays for the apparatus eventually?

By Mr. Hood: Objected to as immaterial.

A. That all depends on the contract he's got—whether that is done on top price or whether this equipment is on a rental basis or not.

Q. 10. The contractor is usually reimbursed for the cost of such equipment, either directly or indirectly, is he not?

Mr. Hood: Objected to as leading and immaterial.

A. That's a question. When you figure on building of course you take your equipment into consideration in figuring your price.

Q. 11. Under what conditions did you use the two sections of chute shown in Exhibit 10?

A. To distribute concrete to the barrows or carts for columns and floors, if necessary.

Q. 12. What do you mean by "floors, if necessary?" I understood that the second floor was poured entirely by chutes except close to the tower; is that correct?

[fol. 246] A. Well on this particular job we used this for columns only.

Q. 13. On the upper floors did you ever use any of the chute sections for running the concrete from the hopper into the carts?

A. No, we did not. We lowered the hopper to a given height

from the floor and discharged this concrete directly into the barrows.

Q. 14. Is the X shaped brace of Exhibit 10 shown leaning against the juncture of the two chutes the same or different brace from what is shown supporting the lower end of the chute in Exhibit 6?

A. Yes, that's practically the same.

Q. 15. In other words, then, you could vary the angle of inclination of the chutes by changing the supports; is that correct?

A. Yes. After chuting a given distance and getting close in to the tower, these other chutes were removed.

(Witness refers to Exhibit 6, the chute lying on the floor in order to concrete the floor close in to the hopper.)

Q. 16. In Exhibit 6, are the reinforcing bars in place on the floor ready for the concrete?

A. No.

Recross-examination by Mr. Hood:

Q. 1. With the arrangements shown both in Defendants' Exhibit No. 6 and Defendants' Exhibit No. 10, a part of the weight of the first metal chute section, is supported by the crotch formed by the two cross 2 x 4s. to which I have already called your attention; that is right, isn't it?

A. That is right.

Q. 2. And these cross 2 x 4s are supported at their lower ends by [fol. 247] the forms for the floor of the building; that is right, isn't it?

A. That is right.

Deposition closed.

Albert E. Culp.

It is stipulated and agreed that if George Botsung were called to testify on behalf of the defendants and examined, he would testify that he worked as a carpenter on the Ingalls Building, became familiar with the construction and use of the chuting apparatus, and that he would corroborate defendants' witness, Culp, both as to his direct and cross-examination, in all particulars relative to the construction and use of said chuting apparatus.

Chicago, February 2, 1921.

Met pursuant to agreement.
Present, as before.

JEROME C. ALDERMAN, a witness called on behalf of defendants, being first duly sworn, deposes and testified as follows in answer to interrogatories by Mr. Jones:

Q. 1. Please state your name, age, residence and occupation.

A. Jerome C. Alderman; thirty-seven years; Villa Park, Illinois. I am a civil engineer with the Great Lakes Dredge & Dock Company.

Q. 2. About how long have you been with this Company?
A. Since May 15, 1909.
Q. 3. By whom were you previously employed?
A. By Fraser & Fox, consulting engineers, Cleveland, Ohio.
Q. 4. Are you familiar with the use of chutes or troughs for dis-
[fol. 248] tributing concrete? If so, state the first instance that you recall of such use.
A. The first instance that I recall was on the construction of a concrete dock built by the Great Lakes Dredge & Dock Company for the Upson Nut Company on the Cuyahoga River, at Cleveland, Ohio. This was during the summer of 1908.

By Mr. Hood: The answer is objected to as relating to matter not properly pleaded.
By Mr. Jones: It is noted that the amendment to the answer, dated February 2, 1921, has been consented to by counsel for plaintiffs, but without waiving the right to imposition of terms by the court.

Q. 5. Please describe this apparatus more fully, producing photographs, if you have any.

By Mr. Hood: It is understood that the above noted objection shall be considered as entered wherever applicable to the testimony of this witness without repetition on the record.

A. This equipment consisted of a deck scow, on which was mounted a concrete mixer having a gravel and sand hopper overhead. At one end of the mixer was mounted a revolving crane, which picked up the sand and gravel carried in pockets on one end of the deck scow. Concrete was discharged from the mixer through a metallic chute, which was, in turn, supported by a boom on the platform over the mixer. In discharging the concrete the boom was moved from side to side, permitting concrete to be discharged into the forms by moving the chute from one side to the other, thus distributing the concrete over a greater area than if it was discharged directly from the mixer to the forms.

[fol. 249] By Mr. Jones: The photograph produced by the witness is marked Exhibit 17, Photograph F.

Q. 6. What is the object to which I point?
A. That is a concrete chute. Additional chutes were placed on the end of the chute, which was made fast to the boom for the purpose of distributing concrete over a greater area. I am referring to the chute shown in the picture upside down and which is projecting over the rear of the form work, opposite the mixer.
Q. 7. How many sections of chute were employed as a maximum?
A. On this particular job there were never over four chutes used in addition to the chute on the mixer.
Q. 8. Do you mean that on this job you sometimes used as many as four sections?

A. As many as four sections, yes.

Q. 9. In such cases how were the three outer sections supported?

A. They were supported either on horses or made fast with lines to the mixer proper, in which case the chutes were held together by pieces of timber, which extended the original chute on the mixer, making all sections as one unit.

Q. 10. Were these chute sections always arranged in alinement with each other, or what was the arrangement?

By Mr. Hood: Question objected to as leading.

A. When the chutes were made fast together they were in alinement, and when they were used on horses they were at an angle with the chute on the mixer, the chute on the mixer being the one shown on the photograph as attached to the mixing plant, the boom of the mixing plant.

Q. 11. When was this picture taken?

A. In the month of August—August 7, 1908.

[fol. 250] Q. 12. What is your independent recollection, aside from the date on the photograph?

A. The way I fix this date in my mind is the fact that I had charge of this job the summer following my marriage, my marriage being on November 16, 1907.

Q. 13. What name appears upon the side of the wooden enclosure in the photograph?

A. Great Lakes Dredge & Dock Company, Travelling Derrick No. 14.

Q. 14. Do I understand that you personally saw this concrete distributing apparatus in use?

A. I personally saw this equipment in use on this job, I having had charge of the work for the owners' engineers.

Q. 15. Can you produce any other illustration of this apparatus?

A. Copy of this photograph is shown in the Engineering Record, dated April 3, 1909, page 424, the lower picture on the page being the one referred to. This photograph is shown in connection with an article entitled "A Heavy Concrete Dock on the Cuyahoga River, Cleveland." This article starts on page 423, and mentions that the contract was carried out by the Great Lakes Dredge & Dock Company, and that the plans and specifications were prepared by Fraser & Fox, consulting engineers, of Cleveland, and that the construction work was carried on under the supervision of Fraser & Fox.

By Mr. Jones: A photograph of this page 424, referred to, is marked for identification "Defendants' Exhibit 25, Photograph of Page 424 of the Engineering Record of April 3, 1909."

It is stipulated that if a competent witness were called to testify, he [fol. 251] would testify that the Engineering Record of April 3, 1909, containing the article referred to was published on said date.

By Mr. Hood: The Exhibit, No. 25, and the stipulated testimony noted above are objected to as wholly irrelevant and immaterial, on the ground that it is subsequent in date to the date of application on

which the patent in suit was issued. Plaintiffs object to encumbering the record through publications and testimony of this character.

Q. 16. Why is the lower end of the suspended chute in the photograph flared outwardly?

A. The object of the flare in the chute, as shown in the photograph, is to permit the chute to be moved sidewise, either one way or the other, without spilling concrete from the mixer over the side of the chute, this flared portion being adjusted underneath the discharge of the mixer.

Q. 17. Have you any other records to identify the date of this job?

A. I have here a duplicate of the contract, the same being a copy of the original contract, the date of this contract being April 16, 1908. I have also various letters, one in particular dated March 27, 1908, from John E. Grady, who was Division Engineer of the Great Lakes Dredge & Dock Company stationed in Cleveland, this letter being to the home office in Chicago, and being received by them on March 28, 1908, the letter stating that the Great Lakes Dredge & Dock Company were awarded the contract for the construction of the dock mentioned.

By Mr. Jones: The correspondence and the duplicate contract are offered to Mr. Hood for inspection.

Q. 18. Where is John E. Grady?

[fol. 252] A. He is not employed by this company at this time.

Q. 19. Where did you get these various papers you have referred to?

A. The papers mentioned are a part of our contract files pertaining to the job in question, and were taken by me from the vault in our office today.

Q. 20. Are you willing to turn these and other papers which you have with you over to us?

A. I have no authority to allow these papers out of my possession.

Q. 21. Who took the picture, Photograph F?

A. That was taken by the Newman Studio, Cleveland, Ohio.

Q. 22. Do you recall the taking of any photographs on this job?

A. I recall that photographs were taken during the construction of this job on various dates, these photoraphs being for the purpose of showing the progress of the work.

Q. 23. Where did this particular photograph come from?

A. That came from our Cleveland office. This same photoraph No. 1601, Negative A A 8-7-08, appears in an alum kept in our Chicago office, and is numered 52.

Q. 24. What is the practice of the Great Lakes Dredge & Dock Company with reference to taking and preserving photographs?

Objected to as incompetent so far as any issues involved in this case may be involved, because the witness became associated with the Great Lakes Dredge & Dock Company subsequent to the date of application upon which the patent in suit was issued.

[fol. 253] Q. 25. About how long were you employed on this Upson Nut Company dock in 1908?

A. About two months.

Q. 26. About what proportion of the concrete dock work did you see carried out?

A. About fifty per cent of the entire project.

Q. 27. Please refer to "Defendants Exhibit 17" and state if you are familiar with any of the apparatus illustrated therein.

A. I have seen apparatus of this type shown in Photographs C and D.

By Mr. Hood: Objected to as immaterial and irrelevant, first, because no date is given, and, second, because Exhibits C and D of Defendants' Exhibit 17 carry upon their faces dates subsequent to the date of filing of the application on which the patent in suit was issued.

Q. 28. When and where did you see such apparatus?

A. Similar apparatus was used by our company in the construction of a dock for the Pennsylvania Railway Company at Erie, Penn., in the spring of 1910.

By Mr. Hood: Objected to as irrelevant and immaterial as relating to a structure and use subsequent to the date of application on which the patent in suit was issued. Plaintiffs protest against encumbering the record with irrelevant and immaterial evidence of this character.

Q. 29. About how long has your Company used such apparatus?

By Mr. Hood: Objected to as irrelevant and immaterial, because the witness has no knowledge, so far as the record shows, of any operations of the character inquired about prior to January 21, 1909, the date of filing of the application upon which the patent in suit was issued.

[fol. 254] A. I have seen such apparatus used by the company for the past ten years.

Q. 30. Who is Christie, whose name appears on these photographs C and D, Exhibit 17, to which you have just been referring?

A. Christie was a commercial photographer, who is now dead, who during his life took various photographs of our different jobs, to show the progress of the work.

Q. 31. Where are the original Christie plates?

By Mr. Hood: Objected to as immaterial and irrelevant, on the ground that evidence already in shows that Christie plates were produced subsequent to January 21, 1909.

A. At the time of Mr. Christie's death his widow offered to sell these original plates to the Great Lakes Dredge & Dock Company, but her offer was rejected, and I have no knowledge at this time of the whereabouts of these plates.

Recess.

Q. 32. In what city were you located when you were first employed by the Great Lakes Dredge & Dock Company?

A. I resided at that time in Cleveland, Ohio.

Q. 34. And about when did you come to Chicago?

A. I came to Chicago at various times after 1909 on visits, but came to Chicago in August, 1915, in charge of construction work, and remained here for approximately nine months. I later returned to Chicago in October, 1916, and have been here since that time.

Q. 35. Can you produce any working drawings or blueprints of the concrete-distributing apparatus used in Cleveland in 1908, and illustrated in Exhibit 17, Photograph F?

A. I have been unable to locate any drawings of this particular [fol. 255] plant or of other plants constructed later for mixing and placing concrete.

Q. 36. There has been some previous testimony regarding concrete-distributing apparatus used by your company in Chicago in 1909, as shown by Photograph B, Exhibit 17. In the absence of drawings, how do you account for the use of somewhat similar apparatus in two different cities?

By Mr. Hood: Objected to as irrelevant and immaterial, as relating to structures and occurrences subsequent in date to January 21, 1909.

A. Our general manager took an active part in the handling of our construction work in connection with jobs in various cities, and he usually suggested that a certain plant be constructed, and sometimes sent men to construct this plant from one city to another. Further, our various superintendents were transferred from time to time from one city to another, and carried out ideas in plant construction that they had gained on the various jobs upon which they were employed.

Q. 37. What is the practice of your company with reference to making drawings and blue-prints of your concrete-handling plants?

A. We do not make a practice of making any drawings, and I know of no drawings in our files on concrete-handling plant, primarily for the reason that this plant is usually made up of portions of other plants, and is assembled for use on certain jobs, and afterwards again dismantled.

Q. 38. What plant are you referring to?

A. I refer to our scow mixers, hoisting and distributing towers and chutes, as well as our car-mixing plants, consisting of concrete mixers, material hoppers, towers, and chutes mounted on railroad cars.

[fol. 256] By Mr. Hood: The answer is objected to as irrelevant and immaterial, on the ground that the knowledge of this witness as to the practice at the Great Lakes Dredge & Dock Company in the matter inquired about has not been shown to antedate May 15, 1909.

Q. 39. You stated that you were unable to locate any drawings of the Upson Nut Company's dock apparatus; how far back did your search extend?

A. My search of our drawings files extended back to drawings made in 1907.

Q. 40. To what kinds of apparatus do the drawings relate that you do make and keep in the files?

A. Deck scows, dump scows, hydraulic and dipper dredges, drill boats, and in some cases pile drivers.

Q. 41. Who was the designer of the distributing apparatus of Exhibit 17, Photograph F, used on the Upson Nut Company's dock?

By Mr. Hood: Objected to as incompetent, the record showing that this witness was not employed by the Great Lakes Dredge & Dock Company in 1908.

A. It was my understanding that that particular plant was suggested by our general manager, Mr. T. C. Lutz, of the Great Lakes Dredge & Dock Company.

By Mr. Hood: The answer is objected to as hearsay.

Q. 42. Are you familiar with the apparatus of the photograph in Album 52 of the Great Lakes Dredge & Dock Company, to which I call your attention?

A. I am. This apparatus consists of a concrete mixer mounted on a deck scow, over which was constructed material bins, and above which was constructed a movable boom supporting a spout, into [fol. 257] which concrete was discharged from the mixer into the forms. It is the same apparatus as Photograph F.

By Mr. Hood: Objected to as relating to matter not properly pleaded.

By Mr. Jones: A reproduction of this photograph is marked Exhibit 17, Photograph G.

Q. 43. Please explain what the long boom and the associated parts are used for in Photographs F and G.

A. The long boom shown in these photographs is the boom on the revolving crane previously described as a part of this equipment, and is used in connection with a clam shell bucket to take material from scows and deposit same in the bins over the concrete mixer, and is not a part of the mixer or chutes in connection with the plant, but is mounted on the same scow with the concrete mixer. This is perfectly clear as shown on Photograph F, Exhibit 17.

Q. 44. What other photographs can you produce of apparatus used by your company to your knowledge for distributing concrete through chutes or pipes?

A. A photograph numbered Negative 18, dated October 10, 1913, showing a floating concrete mixing plant used in the construction of a concrete dock constructed for the Hocking Valley Railroad at Toledo, Ohio. This photograph appears in our Album No. 52. Also a photograph numbered 2133-CC, dated 5-25-1910, showing a float-

ing concrete plant used in the construction of a concrete dock for the C. H. & D. Railway Company at Toledo, Ohio, this appearing in our Album No. 53.

By Mr. Jones: Reproductions of these photographs are marked "Photographs H and I," respectively, as part of Exhibit 17.

Q. 45. In Photograph I, how is the chute supported?

A. This chute was supported by a block and tackle, one end be-
[fol. 258] ing made fast to a timber projecting from the top of the mixer.

Q. 46. Of what material was the tower constructed in Photograph H?

A. This tower is constructed of structural steel.

Q. 47. Trace the progress of the concrete from the mixer to the forms.

A. Concrete discharged from the mixer into a bucket at the bottom of the tower. When the bucket was filled it was elevated towards the top of the mixer, and automatically dumped into a hopper, shown on the front of the tower, from whence it flowed through the spouts, which were supported by a boom printed near the front of the tower, this concrete discharging into the forms.

By Mr. Hood: The answer is objected to on the ground that it relates to a structure subsequent in date to the date of application upon which the patent in suit was granted.

By Mr. Jones: This and similar testimony is offered to show continuous use and development by this company of the earlier forms of apparatus evolved by it prior to the filing date of the Callahan patent.

By Mr. Hood: Such "use and development" does not make the evidence either material or relevant.

Q. 48. What was the purpose of the boom in this apparatus and of the block and tackle in Photograph I?

By Mr. Hood: The immediately preceding objection is repeated.

A. Their use was to permit of a longer chute, and in addition to permit moving of the chute from side to side, in order to distribute the concrete in the forms.

[fol. 259] Q. 49. Did the hopper in Photograph H always remain at the same height on the tower?

A. It did not. This hopper having a means of being raised or lowered, in order to give the chutes sufficient pitch to permit a free flow of the concrete.

By Mr. Hood: Attention is called to the fact that the structure referred to by the witness in the last answer is subsequent in date to the date of the application upon which the patent in suit was issued.

Q. 50. Where did these photograph albums come from that are before you on the table, including those to which you have referred? In this connection, I note that you have not answered Q. 24.

By Mr. Hood: So far as the repetition of Q. 24 is concerned, the question is objected to as incompetent so far as any issue in this case may be involved, the witness not having had any connection with the Great Lakes Dredge & Dock Company prior to May 15, 1909.

A. These albums were taken from the Chicago office of the Great Lakes Dredge & Dock Company, who make a practice of taking photographs of their construction work from time to time, to show progress of the work.

Q. 51. Are you familiar with the photograph in album 51 which I show you?

A. I am familiar with this photograph, I having visited this job at various times.

By Mr. Jones: A reproduction of this photograph is marked "Photograph J," to be included in Exhibit 17.

Q. 52. In this photograph I note that the chute is open at the top; is it the same in this respect as the previous chutes you have been referring to in Photograph H and I, for example?

[fol. 260] By Mr. Hood: Question objected to, on the ground that no showing has been made as to the date when either of the photographs inquired about or of the apparatus which it purports to illustrate. It is noted that the photograph bears date April 2, 1914, and, manifestly, if this is the correct date, all testimony relating to the same is immaterial and irrelevant. If the question is merely for the purpose of establishing the character of the chutes in Photographs H and I, the question is irrelevant and immaterial because of the late dates of those Photographs H and I, and is also grossly leading.

A. The chute referred to in the photograph is of the same construction as those shown in Photographs H and I.

Q. 53. Did your company always employ this type of chute?

By Mr. Hood: Objected to as incompetent, unless limited to a period subsequent to May 15, 1909, the date of witness' association with the Great Lakes Dredge & Dock Company.

A. Since my employment with this company we have always used this chute or a modification thereof.

Q. 54. Have you ever used closed pipes?

By Mr. Hood: Objected to as irrelevant and immaterial, for the reasons stated in the last objection.

A. Our company has used closed pipes as chutes, particularly in depositing concrete, as in caissons and at elevations directly below the point of discharge from the mixer. An example of these pipes is shown in Photograph J, this pipe being on the end of the discharge chute from the mixer. This and similar pipes were used in discharging concrete from the end of the chute vertically below them into the caissons or the pier.

[fol. 261] Q. 55. When did you visit the job shown in this photograph?

A. At various times during the life of the contract. This particular portion of the work, I visited at or about the time this photograph was taken, which was on April 2nd, 1914.

Q. 56. Did you ever visit the construction work shown in Photographs H and I?

By Mr. Hood: Objected to as irrelevant and immaterial. It is understood that this objection may be considered as entered without repetition to all questions and answers relating to these exhibits or the structures supposed to be illustrated thereby.

A. I visited the C. H. & D. job referred to in Photograph I in the fall of 1910, and I also visited the Hocking Valley Dock job, referred to as Photograph H, in the summer of 1913.

Q. 57. About how many photograph albums are there in your company's files illustrating the work they have done, including the eight albums before you on the table, and for how many years have you had personal knowledge of the albums containing the photographs you have been referring to?

A. Approximately one hundred albums are in our Chicago office, and I have seen the same albums of progress pictures in our Cleveland office as far back as the summer of 1908.

Q. 58. You mean that the albums are duplicates, or are there different pictures in the two cities?

A. These albums are different albums, but they contain many duplicate pictures, it being the practice of our division offices to send in a few of their progress photographs to our Chicago office, and it is also a practice of our Chicago office to send various photo-
[fol. 262] graphs of equipment and construction work to our different division offices.

Q. 59. What is the apparent extension at the lower end of the chute in Photograph H?

A. This is a short section of chute which is suspended from the main chute supported by the boom, and its purpose is to give a greater range in distributing concrete in various forms. This short section is capable of being lifted by hand and moved in a complete circle about its point of support at the end of the main chute, which gives a distributing radius equal to the length of this chute, the main chute being able to be moved to either side of the center line of the tower by means of the boom, which is pivoted at the foot of the tower.

Q. 60. Referring to the earlier apparatus, about the period of 1908-10, for example, of what material was the apparatus built, and how was it obtained?

By Mr. Hood: Question objected to as immaterial, and, in so far as it relates to structures subsequent to 1909, is also immaterial.

A. The concrete mixers were taken from the stock, such as was on the market at that time, the towers being towers used on other equipment or constructed for some particular job, the chutes being made

up of various thicknesses of plates, usually about 12 gauge, the hoppers being constructed at the time the plant was assembled, and the floating mixers constructed on whatever deck scows were available at the time the plant was assembled.

Q. 61. Where was the lumber obtained for such apparatus?

A. The lumber was obtained from our stock of lumber carried in our yards, or of second-hand lumber which was used on other jobs, or in some cases purchased from the mill for use in some particular pieces of equipment.

[fol. 263] Q. 62. Would your purchase orders of these different parts of the equipment referred to serve to identify the complete apparatus after it was assembled?

A. As a rule they would not, although in some instances an entire plant was built as a permanent piece of equipment, in which case the original purchase order would identify the plant.

Q. 63. About how early was this last practice adopted?

A. To my personal knowledge, the last mentioned practice was adopted in 1910.

Q. 64. Can you produce any records relating to the construction of your early concrete-distributing plants?

A. I have four cards showing description, history and value of the following plants: No. 11 mixer scow, built at South Chicago in 1907; No. 2 tower mixer plant; No. 2 concrete plant; and No. 3 concrete plant, these cards being typical of cards kept in our files on various pieces of equipment carried on our inventory.

By Mr. Hood: The answer is objected to as irrelevant and immaterial, on the ground that the four cards referred to are dated, respectively, Sept. 11, 1913, Jan. 1, 1915, Jan. 1, 1915, and Jan. 1, 1915. Reference by the witness to the date 1907 is quite clearly hearsay, and a mere quotation from one of the cards dated Jan. 1, 1915, and not within the personal knowledge of the witness.

It is stipulated that a photograph of these four cards may be used with the same force and effect as the originals, the latter to be produced at the hearing if requested.

A photograph thereof is marked "Defendants' Exhibit 26, Photograph of History Cards."

By Mr. Hood: Counsel for defendant is asked whether it will be contended that the complete structure or assembly referred to in [fol. 264] one of the cards dated Jan. 1, 1915, as a description, history and value of "No. 11 Mixer Scow" was produced prior to Jan. 21, 1909.

By Mr. Jones: Defendants' counsel is unable to state at the present time whether an earlier date can be established for this particular apparatus, and therefore will draw no conclusions, but will call witnesses to present the facts.

By Mr. Hood: In view of the statement made by counsel for defendants, Exhibit 26 is objected to as not properly identified, no evidence having been produced that this witness is competent to testify regarding the same, or has any personal knowledge of the struc-

tures to which the various portions of the exhibit are supposed to relate.

Q. 65. Explain how these records are kept and what they indicate.

Objected to as incompetent.

A. These records are kept in a plant file in our office, and as additions are made to the plant, or portions of the plant lost or destroyed, the cards are brought down to date and show the status of the plant on the date on the top of the card.

Q. 66. Who is the party in your office most familiar with these cards?

A. Those cards are kept by various clerks, who enter and leave our employ from time to time, and I have myself as general a knowledge of these cards as anyone in our employ.

By Mr. Hood: In view of the last answer the testimony of this witness relative to the cards in question is objected to as incompetent and not the best evidence.

[fol. 265] Q. 67. From your knowledge of your office system, what does the No. 11 mixer scow card indicate to you?

By Mr. Hood: Objected to as incomptent, in so far as it may relate to anything prior to May, 1909, also as irrelevant, immaterial and not the best evidence.

A. This card indicates to me that the scow upon which this mixer was constructed was built at South Chicago in 1907, and that the mixer plant was constructed at a later date and previous to January 1, 1915. It states on the back of this card that this particular piece of plant was wrecked at Rogers City in 1917.

Q. 68. Is the apparatus of any of the exhibits you have been describing identified by any of these cards?

A. No. 3 concrete plant, shown on card dated January 1, 1915, corresponds to Photograph H, Exhibit 17, this plant being constructed at our Whiskey Island yards, Cleveland, Ohio, in June and July, 1913. This indicates that the boom was 90 feet long, the tower of structural steel and 80 feet high, the material hopper connected directly with the tower and made of steel, the mixer a 1½-yard Lakewood, the hoisting engine on the tower being a 7 x 10-inch. The photograph showing this mixer has a sign on same showing it to be Floating Concrete Plant No. 3.

By Mr. Hood: The answer is objected to as irrelevant and immaterial, because relating to a structure produced in June or July, 1913, four and a half years after the filing of the application upon which the patent in suit was issued.

Q. 69. You have described various concrete plants of the Great Lakes Dredge & Dock Company involving chutes suspended from booms; were any of these chutes or booms purchased from William H. Insley, one of the plaintiffs in this suit?

[fol. 266] A. None of the chutes or booms mentioned was purchased of Insley.

By Mr. Hood: The question and answer are objected to as incompetent, the witness not having been qualified.

Q. 70. Did you make any suggestions or assist in any way in the construction of the several outfits you have been testifying to about?

By Mr. Hood: Objected to as irrelevant and immaterial in so far as the question may relate to anything subsequent to January, 1909.

A. On the plant shown in the photograph as Floating Concrete Plant No. 3, I made certain calculations involving the strength of the tower, points of suspension of the chutes, method of pivoting the heel of the boom near the foot of the tower.

By Mr. Hood: The answer is objected to, on the ground that it relates to matters long subsequent to the date of the patent in suit.

Q. 71. Was any of the apparatus you have been testifying about constructed as the result of suggestions obtained from Wm. H. Insley or the Concrete Appliances Company, plaintiffs in this suit?

Objected to as immaterial.

A. No equipment has been constructed from our knowledge of the Insley or other equipment, but has been developed from our own experience. On the other hand, we have been the pioneers in the design of distributing plants for concrete, and I have at various times taken part in conversations of various heads of our company, in which it has been mentioned that Mr. Inlsey had looked over equipment which we had designed and constructed, he afterwards putting on the market equipment of similar design and character.

[fol. 267] By Mr. Hood: The alleged report by this witness as to statements alleged to have been made by unnamed parties is objected to as irrelevant, immaterial, incompetent and hearsay.

Q. 72. What is the location of the Iroquois Plant at South Chicago with reference to the main lines of the several railways connecting Chicago and New York and other Eastern cities?

A. It is approximately north of the east side station of the New York Central and Pennsylvania lines, and visible to trains passing at or about this location. Before South Chicago was so thickly built up, it could be seen from the point where the New York Central crosses the Calumet River. At either of these points a clear enough view could be obtained to distinguish various pieces of plant, such as a concrete tower, etc.

By Mr. Hood: Answer is objected to as irrelevant and immaterial. Nothing which occurred subsequent to January 21, 1909, in the particulars referred to by the witness, can possibly affect any issue in this case.

Q. 73. Have you made any effort to look up your company's records to determine the extent to which you employed labor in what has been said to be the panic year of 1907?

A. I have endeavored to find the pay roll during 1907 and 1908, but have been unable to locate them among our records. Our records at that time—a portion of them—have been destroyed, and others stored at our yards, no record having been kept of their location.

Q. 74. Can you produce any records to show when the Gary intake was built and also the Iroquois Iron Company's plant?

By Mr. Hood: Objected to as incompetent.

[fol. 268] A. I have here record of calculations, costs, etc., kept on the Iroquois job, among which is a blue-print, together with the original tracing, showing No. 1 tower mixing plant, with a notation that it started in on the concrete work on August 25, 1910. This same blue-print shows tower mixer No. 2, and other mixers were started at other dates, a little later in 1910. This file also contains a letter from Julian Kennedy, constructing engineer, representing the Iroquois Company, under date of June 17, 1910, this letter being a proposal by the Great Lakes Dredge & Dock Company, and being accepted over the signature of the president of the Iroquois Iron Company, this proposal being for placing certain fill, which was a part of the contract. In addition we have in this file copy of contract dated the 3rd day of August, 1910, setting forth prices for concrete, steel reinforcement, excavation and piles. This contract was signed on the part of the Iroquois Iron Company by its president, and by Walter Cahill, second vice president of the Great Lakes Dredge & Dock Company.

By Mr. Jones: These files will be further identified later and are offered to Mr. Hood for inspection at this time. A blue-print of the tracing referred to is marked for identification "Defendants' Exhibit 27."

By Mr. Hood: The entire preceding answer of the witness is objected to as irrelevant and immaterial, because relating wholly to occurrences subsequent to January 21, 1909. The offer of inspection of files is declined, if said files are to be further identified in the future. The blue-print is objected to as irrelevant and immaterial, because relating to structures whose dates are subsequent to the date [fol. 269] of application for the patent in suit. No objection is made on the ground that it is a print instead of the original. Plaintiffs again protest against the padding of this record with evidence relating to structures and occurrences long subsequent to the date of filing of the application upon which the patent in suit was issued.

(Answer continued:) I submit also original contract, dated July 1, 1906, entered into with the Indiana Steel Company for the construction of a pump house, concrete foundations, etc., in connection with the intake and waterworks on the Steel Company's property of

Gary, Ind. This contract was signed on the part of the Great Lakes Dredge & Dock Company by T. C. Lutz, first vice president. These various papers offered were taken from our office files at our Chicago office by me.

By Mr. Hood: The testimony of this witness relative to the alleged Indiana Steel Company contract is objected to as incompetent, the witness not having qualified.

Q. 75. Can you identify Defendant's Exhibit 19?

Objected to as irrelevant and immaterial, the exhibit showing on its face that it was published long subsequent to the patent in suit, and no evidence has been introduced to change the prima facie showing.

A. The exhibit referred to is a catalogue gotten out by the Great Lakes Dredge & Dock Company in 1912, and contains pictures taken from photographs of our various construction work carried on previous to this date. A portion of these photographs were gotten together by me, showing construction work in Cleveland, and at other points on Lake Erie.

Q. 76. Explain a little more fully the manner of moving or adjusting the chutes to permit you to vary the point of distribution [fol. 270] of the concrete on the Upson Dock job in 1908.

A. Referring again to Photograph F, the boom shown over the mixer was pivoted on its lower end, made fast with a cable from its upper end, his cable being fastened to an eye in the material hopper, the boom being capable of being moved from side to side. The chute was raised or lowered by means of a block and tackle connected to a sling on the chute, the block and tackle being connected to a winch under the material hopper over the mixer. Additional chutes were placed on the end of the discharge chute shown in the picture, either in a straight line or curved to one side or the other, thereby distributing the concrete directly in front of the mixer, or over an area extending to either side of the mixer.

Q. 77. What was the consistency of the concrete?

A. The concrete was rather wet, or what is known as "sloppy," although at this time, and previous to this time, common practice was to place concrete rather dry.

Q. 78. What consistency did architects favor at this time?

A. Architects at this time favored a drier mixture of concrete, but as a rule the wetness of the mixure was left by the owners to our best judgment.

Direct examination closed.

Cross-examination by Mr. Hood:

X Q. 79. What education did you have tending to qualify you as a civil engineer?

Objected to as immaterial.

A. High school and technical school education.

X Q. 80. What technical school, and when did you graduate?

[fol. 271] A. Throop Polytechnic Institute, Pasadena, California. I did not graduate from this school, but took two years' special work in civil and electrical engineering. This was 1900 and 1901.

X Q. 81. I suppose that since 1901 you have made it a practice to keep yourself reasonably informed of developments in civil engineering and structural matters, have you not?

A. I have.

X Q. 82. And have tried to keep up to date?

A. I have.

X Q. 83. In Defendants' Exhibit 17, Photograph F, the chute section, which is suspended from the boom, is not in position to receive concrete?

A. Not as shown on the photograph.

X Q. 84. In order to place this chute section in position to receive concrete from the mixer, it was lowered by the block and tackle by which it was suspended, and the end nearer the observer (in Photograph F) swung around and allowed to rest in a semi-circular crotch formed in the upper edge of a piece of timber extending crosswise of the framework around the mixer; that is right, isn't it?

A. That is correct.

X Q. 85. The boom, from which the first chute section was suspended, appears in Photograph F to be resting on a cross timber or hand rail; is that right?

A. The photograph shows the boom apparently resting on the hand rail, whereas in reality there was a slight clearance between the hand rail and the boom, this clearance being maintained by the cable from the point of the boom to the material hopper.

X Q. 86. In Defendants' Exhibit 17, Photograph G, it looks very much as if this boom rested on the hand rail, doesn't it?

[fol. 272] A. In this photograph the boom has the appearance of resting on the hand rail. My reason for being positive that it did not was that I have seen this boom moved sideways in order to move the spout to one side or the other, to deposit the concrete in layers, which was common practice at the time the photograph was taken as well as at the present time.

X Q. 87. About how far, that is, through how much of an angle was the first chute section in this apparatus swung from the neutral position in alinement with the axis of the mixer?

A. To an angle of approximately 30°.

X Q. 88. That is the total swing from one extreme to the other you think was as much as 60°?

A. It was.

X Q. 89. What were the cross-sectional dimensions of the heavy timber at the upper front corner of the sand hopper?

A. As I remember this timber, it was approximately 10 x 10 inches.

X Q. 90. And the rear face of this timber was 6 or 8 inches in front of the parallel timber just below it; wasn't it?

A. Apparently so.

X Q. 91. And how was the cable which supported the outer end of the boom attached to this upper cross timber which you say was about 10 x 10 inches?

A. The photograph does not show this plainly, but to the best of my recollection it was attached to an eye-bolt in the timber.

X Q. 92. That is, there was an eye-bolt, the shank of which projected horizontally through the timber; is that right?

A. That is my recollection of it.

X Q. 93. Do you recall the approximate size of the eye, and the [fol. 273] diameter of the material of which it was made?

A. I do not remember this detail.

X Q. 94. As an engineer, what is your judgment of what the probable size would be?

A. It was probably seven-eighths or one inch in diameter.

X Q. 95. That is, the material of which the eye was made was seven-eighths or one inch in diameter; is that right?

A. That is the probable size.

X Q. 96. And the eye itself was probably an inch and a half or two inches in diameter, because it had to be large enough to go through the boom-supporting cable and also the connecting link of the snatch block, through which the cable for supporting the chute is passed. That is probably right, isn't it?

A. It is.

X Q. 97. And the lower end of the boom was stepped against the forward face of the center vertical post, which lies an inch or two back of the forward face of the cross-timber, which is below and back of the cross-timber to which the upper inner end of the boom-supporting cable is attached: is that right?

A. I do not just recollect how the heel of the boom was stepped in as you describe it, but my recollection of it is that it came out beyond the center post, as shown on the drawing, in order to bring it nearer the plane of the eye-bolt above.

Adjourned until Thursday, February 3, 1921, at 10 o'clock.

(Deposition of J. C. Alderman Resumed)

X Q. 98. How often did you shift the scow?

A. The concrete was divided into blocks, as I remember, of ap- [fol. 274] proximately 40 feet in length, the bulkhead being in the form at the end of each block. The scow was usually set up in the center of these blocks and the concrete poured in either direction from the mixer, chuting it as far as possible, and pushing it along with hoes or shovels the balance of the way.

X Q. 99. Then you shifted the scow for each block, did you?

A. Yes.

X Q. 100. You did not make these history cards, "Defendants' Exhibit 26," did you?

A. I did not.

X Q. 101. You have no personal knowledge of apparatus of the Great Lakes Dredge & Dock Company prior to the apparatus shown in Photograph F, have you?

A. I have not.

X Q. 102. And whatever knowledge you have of the apparatus shown in Defendants' Exhibit H is subsequent to the time you entered the employment of the Great Lakes Dredge & Dock Company in May, 1909?

A. It is.

X Q. 103. You have no personal knowledge of the Gary contract of 1906 which you have produced, have you?

A. No knowledge, other than that gained from the files.

X Q. 104. And that was subsequent to May, 1909, and in fact was very recent?

A. My knowledge of this has been subsequent to May 15, 1909, but it has been probably of three years' standing.

X Q. 105. In Photograph F there are a large number of inclined braces, such, for instance, as the one upon which the hand of one [fol. 275] of the workmen rests. This photograph is a fair illustration of the arrangement and spacing of these cross braces during the operation of the concreting, is it?

A. It is.

X Q. 106. And in the use of the apparatus the metal chute, which is suspended from a boom, projected between two such braces down into the forms; is that right?

A. It did.

X Q. 107. You have spent a good deal of time searching the records of the Great Lakes Dredge & Dock Company before testifying in this case, have you?

A. I have.

X Q. 108. At whose direction?

A. At the direction of Mr. E. James Fusick, who is assistant general manager.

X Q. 109. Of the Great Lakes Dredge & Dock Company?

A. Yes.

X Q. 110. And you appear as a witness in this case under his direction?

A. Yes.

X Q. 111. Do you know Mr. Insley, about whom you have been asked?

A. I do not know him personally, other than having heard of him often.

X Q. 112. You never have seen Mr. Insley, so far as you know?

A. Not so far as I know.

X Q. 113. Then, you do not know of your own knowledge that Mr. Insley ever saw any of the apparatus of the Great Lakes Dredge & Dock Company?

A. Not of my own knowledge.

X Q. 113a. Why have you been willing to throw mud at Mr. Insley, as you have in your testimony?

[fol. 276] A. My testimony has not been given with a view to throwing mud at Mr. Insley, but, as previously stated, is from conversations I have heard at various times that Mr. Insley has seen our equipment and copied certain features of construction.

X Q. 114. But that was purely gratuitous, so far as your own knowledge is concerned, wasn't it?
A. It was.

Cross-examination closed.

Redirect examination by Mr. Jones:

R. D. Q. 115. Will you refer to Exhibit 26, and explain the structure referred to as "concrete spout 10″ open pipe by 36′ long?"

By Mr. Hood: Objected to as incompetent, no showing having been made that this witness has any personal knowledge of the particular structure involved.

A. The description as shown would mean a chute 10 inches wide, probably having been made from a sheet iron pipe in which a portion of same was removed, and having a total length of 36 feet.

By Mr. Hood: The answer is objected to as a pure guess.

R. D. Q. 116. Did you see any concrete chutes used in California?
A. I did not.
R. D. Q. 117. Are you familiar with the handwriting of John E. Grady?
A. I am.
R. D. Q. 118. In Great Lakes Dredge & Dock apparatus, of which Photograph H, Exhibit 17, may be assumed to be typical, was the [fol. 277] lower end of the boom always left in the same position, or was it ever moved in any direction other than to swing about a pivot?

By Mr. Hood: Objected to as irrelevant and immaterial, because relating to a structure subsequent to the date of the application upon which the patent in suit was issued, and further, because not proper cross-examination.

A. The heel of the boom was never moved from its original position to my knowledge.
R. D. Q. 119. Do you know who made the cards of Exhibit 26—the long-hand portions?
A. I do not.

Redirect examination closed.

Recross-examination by Mr. Hood:

R. X Q. 120. You have no personal knowledge of the time when the "concrete spout 10″ open pipe by 36′ long," referred to one of the cards of Defendants' Exhibit 26, was produced or put into use, have you?
A. I have not.

Deposition closed.
Signature waived.
It is stipulated that if A. L. Newman, of Cleveland, Ohio, were called as a witness on behalf of defendants, he would testify that he was a commercial photographer in Cleveland in 1908, and he

was employed by the Great Lakes Dredge & Dock Company to take progress photographs of the building of the dock for the Upson Nut Company of Cleveland; and that he took Photograph "1601, Negative AA," August 7, 1908, identified as Print F of Defendants' Exhibit 17; and that he took Photograph "1601, Negative AAA," August 7, 1908, identified herein as Photograph G, Defendants' Exhibit 17.

[fol. 278] STEPHAN CREUTZ, JR., a witness produced, sworn, and examined on behalf of defendants, deposes and testifies as follows in answer to questions by Mr. Jones:

Q. 1. Please state your name, age, residence and occupation.

A. Stephan Creutz, Jr.; thirty-five years; 7115 University Avenue, Chicago. I am assistant general foreman of the Universal Portland Cement Company, Buffington Plant.

Q. 2. Were you ever employed in the vicinity of Gary, Ind.?

A. I was. I was employed by the Great Lakes Dredge & Dock Company.

Q. 3. About when did your employment begin?

A. About the day after Labor Day of 1906.

Q. 4. What kind of work were you doing at that time?

A. I was sent out there to be more or less of a straw boss, chasing the gangs of men and speeding up the work.

Q. 5. What sort of work was the Great Lakes Dredge & Dock Company doing?

A. We were excavating the blast furnace pumping station.

Q. 6. Did you see the building of the pumping station?

A. Yes, sir.

Q. 7. Was any concrete work done on it?

A. Yes, sir.

Q. 8. Will you describe the apparatus for distributing the concrete?

A. The first apparatus we used was a concrete mixer set on a flat [fol. 279] car, and the concrete was spouted from the mixer into the bottom of the excavation. We called it chutes then. There was an improvement made on this apparatus to distribute the concrete from one location to another within a radius controlled by a boom holding the chutes or spouts. The ends of the spouts were—the location of the ends of the spouts were placed by swinging the boom that carried the concrete spouts.

Q. 9. On what part of the work was this boom and spout apparatus used?

A. It was used on the intake for the water tunnel of the blast furnace pumping station.

Q. 10. Do you recall who made this improvement you refer to?

A. Mr. Sandy Cameron.

Q. 11. How do you fix the date of Labor Day, 1906, rather than some other year?

A. That being the first time I went out to Gary, Ind.

Q. 12. I mean how do you know it was 1906 and not some other year?

A. I know it was 1906 because the first work was being done on the building of the Gary steel plant.

Q. 13. How do you know that the Gary steel plant was not begun in 1907 or 1908? Have you any way of fixing the year?

A. I know that it was not in 1908, because I became married, and at that time I was employed by the Great Lakes Dredge & Dock Company, and the Gary water tunnel sinking of the first—beginning the sinking of the first shaft for the first water tunnel.

Q. 14. When you were married?

A. February 26, 1908.

Q. 15. I call your attention to Photographs K, L, and M, Exhibit 17, and will ask if you are familiar with anything shown in these pictures?

By Mr. Hood: Objected to as leading.

[fol. 280] A. I am familiar with Exhibit K, concreting the blast furnace pumping station. Photograph L—there was a little doubt right here (Witness has Photograph L in his hands) whether it is the concrete dock or the intake, or the blast furnace pumping station. Photograph M shows the concreting of the blast furnace water tunnel.

Q. 16. Did you ever see the apparatus of Photograph M?

A. I did.

Q. 17. About when?

Objected to as leading, in view of the fact that the witness has the photograph before him.

A. In the latter part of 1906.

Q. 18. If you saw the apparatus of Exhibit K, state about when you saw it.

A. That was about the latter part of November, 1906.

Q. 19. Please describe the operation of Photograph M.

Objected to as leading, in view of the fact that the witness has been handed this photograph.

A. The Photograph M shows the placing of concrete for the blast furnace pumping station water tunnel.

Q. 20. Please trace the movement of the concrete from the time it was mixed until it was finally deposited.

By Mr. Hood: Objection to Q. 19 repeated.

A. From the time the concrete was mixed, it was discharged from the mixer into a charging box or a hopper, and from the bottom of this the concrete ran down the spouts suspended from a boom. This boom was so arranged as to swing at one end in a circle, the object being to reach inside concrete forms.

Q. 21. Are you familiar with the apparatus of any of the Photo- [fol. 281] graphs A to J, inclusive, of Defendants' Collective Exhibit 17?

A. I am familiar with Photograph A, showing in the background the teel work of the blat furnace pumping tation, and the excavation of the water tunnel for the blast furnace pumping station, being done by locomotive crane standing on a trestle. Between this trestle and the blast furnace pumping station part of the concreting was completed. The photograph shows preparations for supporting the bank and the excavation for the construction of forms for concreting. I am familiar with the apparatus of Photograph B, as it was used during the summer of 1908 to concrete the west dock and turning basin, also the coke oven pumping station. I am not familiar with Photograph C, but have seen the equipment when going down the Calumet River. I am not familiar with D, that is, I am familiar with the concreting apparatus, but not on this particular work. I am not familiar with Photograph E. I am not familiar at all with F; the only thing that is familiar in this photograph is that the spout is like we have used on our work, but with a wider opening at one end, so that it could be swung over a little to one side or the other to allow the concrete to be placed in the forms, and also the short boom. I am not familiar with G. I am not familiar with Photograph H—that is, not familiar at all with the work, but I am familiar with the system of concreting. I am not familiar with I; and not familiar with J.

By Mr. Hood: The answer is objected to as irrelevant and immaterial, and, except as to the apparatus shown in Photographs A, F, and G, as relating to structures, which, according to the evidence heretofore adduced by defendants, were not produced until after the [fol.282] date of filing of the application upon which the patent in suit was issued.

Q. 22. Did you ever know William T. McCann?

A. Yes, sir.

Q. 23. When and where did you know him?

A. I first met Mr. McCann about 1902 on the construction of the Thirty-ninth St. intercepting sewer pumping station, Chicago.

Q. 24. Did he have anything to do with the Gary work?

A. He did; he was the Great Lakes Dredge & Dock Company's carpenter foreman on the construction of the blast furnace pumping station and water tunnel.

Q. 25. Please refer to Exhibit 17, and explain, if you can, the location of the trestles in Photographs A and M.

A. The trestle in Photograph M was constructed to allow the Great Lakes equipment to pass over an excavation, which was made for the blast furnace lorry car and high line foundations. The location of the trestle was in the neighborhood of about two or three hundred feet east of the blast furnace pumping station. In Photograph A, I don't exactly remember how far it is, but I should judge between three and four hundred feet east of the blast furnace pumping station.

Q. 26. Then, as I understand it, these are not the same trestles shown in the two pictures; is that correct?

A. They are not the same trestles.

Q. 27. Where is the trestle of Photograph M in Photograph A?

A. On this side (witness points to the locomotive crane cab); it would be between the trestle the locomotive crane was on and the blast furnace pumping station.

Q. 28. You mean that it appears in the photograph, or that it is [fol. 283] behind the crane cab to which you pointed?

A. Behind the crane cab.

Q. 29. I call your attention to a railway track passing under the trestle of Photograph M, and will ask if this track appears in Photograph A?

A. It does. (Witness indicates track below and beyond the trestle.)

Q. 30. About when did you see the equipment of photograph C from the Calumet River?

A. I don't remember just what year it was.

Q. 31. Have you ever seen apparatus like that shown in photograph E, and if so, when?

A. I have seen similar apparatus at Indiana Harbor. I don't know the date. I was inspector for the Inland Steel Company at the time their concrete dock was being built.

Q. 32. Can you state approximately how many years this would be after the beginning of the Gary work?

A. About four years.

Q. 33. You have referred to several different types of apparatus of this character with which you are familiar. Have you ever seen such apparatus in any city other than near Chicago, that is, the Chicago district, which would include Gary?

A. I saw two floating concrete equipments on the Municipal Pier in Chicago.

Q. 34. Referring to photograph B, Exhibit 17, about how big a job was under construction?

A. That was constructing the coffer dam for the coke oven pumping station, so that forms could be built below the water for making concrete foundations. I have the dimensions of it, but I haven't them with me—it was somewhere around 80 feet long and 35 or 40 feet wide, and 28 feet deep.

[fol. 284] Q. 35. On what is the apparatus mounted in this photograph?

A. It is mounted on a scow.

Q. 36. What is the body of water on which the scow is floating?

A. The Gary turning basin.

Q. 37. Was any concrete work done in connection with this turning basin, other than the concrete foundations you have just referred to, for the pumping station?

A. Nearly all the concrete dock for the Gary harbor, including the turning basin.

Q. 38. How extensive a job was this dock?

A. It was several thousand feet long—around 5,000 feet.

Q. 39. Please describe the apparatus in this photograph B.

Objected to as leading, as the witness has the photograph before him.

A. This apparatus is a concrete equipment built on a scow, consisting of a concrete mixer at the proper elevation, so that concrete could be spouted into the concrete dock; and above the mixer was constructed two hoppers, one for stone and one for sand, this being at one end and the other end of the scow being the cement shed. A boom was placed to support the chute, for the purpose of raising the spout so that the concrete equipment could be moved—I meant to state for the purpose of spouting the concrete in the forms for the dock, and also to raise the spout when moving the equipment ahead.

Q. 40. You state that the boom was for the purpose of spouting the concrete in the forms. Please explain more fully what you mean.

A. The purpose of the boom was to control the position of the end of the spout.

Q. 41. How did it do this?

[fol. 285] A. By booming up the boom and swinging it from side to side.

Q. 42. In the spouting apparatus on the intake job, which you say is shown in photograph M, about how many lengths of chute were employed at various times in the work?

A. Well, one, two or three.

Q. 43. Referring to this photograph, what do you consider one length of chute?

A. I consider one length of chute being the number of sections of chute used.

Q. 44. I mean the photograph M; do you consider the chute extending from the hopper to the vertical suspending rope to be one section or two sections in your previous answer?

By Mr. Hood: Objected to as grossly leading.

A. To be two lengths of spout or two sections.

Q. 45. Then, if you refer to those two sections individually, what was the arrangement when you had only one length of chute, as in your answer to Q. 42?

A. The number of sections used would be decided by the distance the concrete form was from the mixer.

Q. 46. What is the greatest number of sections that you recall having seen used at any one time?

A. Why, five or six sections. What I had in mind was how many sections I had seen used. On this particular work about three sections is the most I have seen used.

Q. 47. Do you recall any photographs being taken of the Gary work?

A. I do. Photographs were taken of the progress of the buildings of the Gary steel plant, including building foundations, harbor and docks, at numerous times, beginning in 1906, after I went to work there.

Q. 48. Do you recall how long it took to build the Gary plant suf-

[fol. 286] ficiently to enable the blast furnaces to begin operation?

Objected to as not the best evidence.

A. About—a little over two years.

Direct examination closed.

Cross-examination by Mr. Hood:

X Q. 49. When did they begin pouring concrete at Gary?
A. In the fall of 1906.
X Q. 50. In what month?
A. In the latter part of November or December.
X Q. 51. And that apparatus for pouring the concrete consisted in part of a car on which the mixer was placed; is that right?
A. Yes, sir.
X Q. 52. Then there was an open top wooden spout, wider at one end than the other, that was placed so as to receive the concrete from the mixer; is that right?
A. Yes, sir.
X Q. 53. Did you do any work on the concrete mixer or spouting apparatus?
A. I did no work in the construction of it.
X Q. 54. Did you work in handling it?
A. Yes, sir.
X Q. 55. What were your duties in handling this apparatus?
A. My duty was to watch the spout and see that the men kept it from blocking up.
X Q. 56. Did that first apparatus have a spout or chute that was suspended from a boom, so as to receive the concrete as it flowed from this open topped wooden spout or chute?
A. No, sir.
[fol. 287] X Q. 57. At first you had some sheet metal chutes or troughs which were placed so as to receive the concrete from the wooden trough; is that right?
A. No, sir, we had a steel spout. The first concrete mixer was just a steel spout that went up to the mixer, and then we improved that idea with the boom that the spout be suspended from.
X Q. 58. Then at first, in the latter part of November, 1906, you had a steel trough that was arranged in position to receive the discharge from the mixer, about as shown in photograph L of Exhibit 17; is that right?
A. I don't recollect this photograph.
X Q. 59. What was the very first concrete work in connection with which this mixer car was used at Gary?
A. In concreting the blast furnace pumping foundation.
X Q. 60. That included a wall close to the lake and at right angles to the water tunnel or intake; is that right?
A. Well, I would not call it close to the lake; it was quite a way from the lake.
X Q. 61. Then they built this pumping station foundation first,

and then extended the water tunnel structure from the pumping station foundation toward the lake; is that right?

A. No, sir.

X Q. 62. Suppose you try if you can straighten out as to just what this arrangement was.

A. You mean the arrangement of the position of the pumping station with reference to the intake?

X Q. 63. Yes, and what you call the water tunnel.

A. The Gary harbor was excavated from the shore line due north and due south several thousand feet south of the shore line, and the concrete dock was constructed on the west side of this harbor, and in this dock the intake was constructed for the water tunnel that sup- [fol. 288] plied the water for the blast furnace pumping station, the pumping station being due west of this intake along the line of the blast furnaces.

X Q. 64. Is what you have called the "Gary Harbor," which you say was excavated due south from the lake shore line, the same thing as the turning basin that you have referred to?

A. The turning basin took place at the south end of the harbor.

X Q. 65. Which was built the first, the dock, the intake, the water tunnel, or the blast furnace pumping station foundation?

A. The blast furnace pumping station.

X Q. 66. And they began to pour concrete into this foundation the latter part of November or sometime in December, you hink?

A. I do.

X Q. 67. And the apparatus they used was a flat car or platform on wheels of a gauge to run on a standard railroad track with the mixer mounted on the car, and some sand and gravel hoppers, or charging platform rather, above the mixer; is that right?

A. No, sir, if you have reference to the first equipment.

X Q. 68. What was the first equipment which you started to use on this pumping station foundation?

A. A flat car with a concrete mixer on it, and a platform built over the top of the mixer, so that men could push wheelbarrows over the top of the mixer, and dump them in proportionate amounts of loads into the mixer.

X Q. 69. That is the apparatus on which three men are standing in photograph F of Exhibit 17.

A. No, sir, I don't think it is. I didn't know about this photo- [fol. 289] graph being taken, but it looks familiar. It looks exactly like the concrete mixer used on the blast furnace pumping station foundation.

X Q. 70. At first, how did you get the concrete from the mixer to the chutes?

A. The first time the chute was put right at the end of the mixer, and it didn't work out very good.

X Q. 71. You mean that first one section of the sheet metal chute was put up to feed the concrete from the mixer?

A. Yes, sir.

X Q. 72. And that sheet metal chute which projected down into the excavation which had been provided for the pumping station foundation?

A. Yes, sir.

X Q. 73. Well, that arrangement was a good deal like the arrangement of chute and mixer which you find illustrated in photograph L, wasn't it?

A. Yes.

X Q. 73. When was the open-topped wooden chute, shown in photograph K made? I mean the wooden spout between the two men in the upper left-hand corner of the photograph.

A. That was made shortly after the first try-out.

X Q. 74. And before any boom of any kind was put on the mixer car?

A. I don't understand that.

X Q. 75. This wooden chute, which is illustrated in the upper left-hand corner of photograph K and extends between the two men was made and put into use for some time before they built any boom on the mixer car; that is right, isn't it?

A. No, it was just a very short time.

X Q. 76. How far had the foundation work progressed on the pumping station when this wooden chute was made?

[fol. 290] A. Some of the bottom was put in.

X Q. 77. This photograph K shows the excavation, the bracing and some of the forms for the pumping station foundation, doesn't it?

A. It does.

X Q. 78. Can you tell from this photograph K how far along the pumping station foundation had progressed at the time of the photograph?

A. At the time this photograph was taken the foundation for the pumps and the walls was being concreted.

X Q. 79. About how long after this photograph K was it before the pumping station foundation was done and they shifted the mixer car ready to begin work on the intake or water tunnel?

A. They began excavating for the intake for the water tunnel while the concreting was being done at the blast furnace pumping station.

X Q. 80. About how long did it take to complete the pouring of concrete in the pumping station foundation after the work had reached the condition shown in photograph K?

A. It was the completion of the blast furnace pumping station foundation, which was completed in the early part of the summer 1907.

X Q. 81. You don't find any part of any boom construction for supporting the metal chutes in photograph K, do you?

A. From the appearance of the photograph the boom is broke. The boom broke down.

X Q. 82. What is there on the photograph that indicates to you that the boom broke down?

A. From the fastenings on the end of the timber that leads into the concrete chute.

Witness states that he has been working on night shift and has [fol. 291] had no sleep for nearly twenty-four hours. An adjourn-

ment is therefore taken until Friday morning, February 4th at 9 a. m.

Chicago, February 4, 1921.

Parties met pursuant to adjournment. Present as before.

Cross-examination of Mr. Creutz continued:

X Q. 83. You do not find anything in photograph K which would indicate parts of a broken boom, do you?

A. I see by photograph K that the boom is broken—it fell down into the chute.

X Q. 84. That piece of board that looks nearly white, and has its lower end lying in the metal chute and its upper end laid over the open end of the wooden spout, was put in there to prevent the concrete from splashing over the side of the metal chute, because the metal chute was placed at an angle to the wooden chute; isn't that right?

A. I cannot see whether—with the magnifying glass, it appears that there is about a 2-inch plank put into the chute and a chain and hook fastened to a metal eye on the chute and supported by a block and tackle which holds up the chute.

X Q. 85. And that 2-inch plank is tied in place by having its lower end projected beneath a piece of cable which is wrapped around the metal chute just below the eyes into which the chain hooks are hooked, and at the upper end there is cable passed around the plank and apparently tied back to the mouth of the wooden chute?

A. That is right.

X Q. 86. If that piece of plank was simply part of a broken boom, it would hardly have been intentionally tied into place in the manner shown in the photograph, would it?

A. I do not know.

[fol. 292] X Q. 87. You have not any independent recollection of having seen the boom break?

A. No, I haven't. I was not there; I was on this and on various other jobs every day.

X Q. 88. Now, as a matter of fact, you are not sure just how long the mixer car was used before they put the boom on it, are you?

A. I don't know the number of days, but it was a very short time after the first mixer was used.

X Q. 89. Are you very sure that the boom was put on the mixer car within thirty days from the time the mixer car was first used on the blast furnace pumping station foundation?

A. I don't know whether it took within thirty days after the first mixture was used, but about five weeks I should judge, on account of the delays we had on the job.

X Q. 90. Are you sure that the booms were put on the mixer car before the pumping station foundation was finished?

A. Yes, sir.

X Q. 91. You are just as sure of that as you are about any other fact that you have testified about, aren't you?

A. Yes, sir.

X Q. 92. Now, when they put the booms on the mixer car, both booms were put on at the same time, were they not?

A. I could not say whether they were put on at the same time or not. The first boom was put on to help support the hopper; that was when we were close to the foundation, and the longer boom was put on when we extended the chutes—I believe at the time that the carpenters were building both booms, because Mr. Cameron and myself had been talking about spouting the concrete and doing away [fol. 293] with the wheelbarrow work, and at this time we were also concreting the first dock work with another concrete mixer.

X Q. 93. You mean that work on concreting the dock along the west side of the harbor was under way while you were concreting the pumping station foundation?

A. Yes, sir.

X Q. 94. The "first boom" which you have mentioned was the short V-shaped boom which was fastened to the two uprights forming part of the frame around the mixer, was it?

A. It was two chambers placed in V-shape.

X Q. 95. That boom could not be swung from side to side, could it?

A. No, not the short one.

X Q. 96. When they put the long boom on the mixer car, they at the same time erected the mats which is shown in photograph A projecting above the loading platform of the mixer car and braced sidewise by two diagonal bracings; is that right?

A. They must have.

X Q. 97. You have not any independent recollection of that fact, have you?

A. Not being there at the time some of this construction was going on, owing to conditions of handling our equipment, a good many different guy lines were used to hold up the boom on the concrete mixer after breakdowns, due to the boom. I could not say that the perpendicular mast braced from two sides was built at the same time that the boom was built?

X Q. 98. Well, Mr. Creutz, you know that that long boom could not be raised and lowered without the provision of a mast of some such kind as shown in photograph A, could it?

A. It could be raised and lowered by block and tackle pulled by hand.

[fol. 294] X Q. 99. Was it so raised and lowered?

A. The first one we raised and lowered by a block and tackle pulled by hand.

X Q. 100. What was that hand-operated block and tackle fastened to?

A. It was fastened to a cleat, just a temporary cleat.

X Q. 101. What was the temporary cleat fastened to?

A. To a timber on one side of the mixer.

X Q. 102. Suppose you point out on Photograph A the spot where you think this hand-operated block and tackle was fastened.

A. This apparatus is the complete improvement after we began with the second concrete mixer, then using a boom and spouting the concrete. This Photograph A show the work being done some time later than the concreting of the foundation of the blast furnace pumping station foundation.

X Q. 103. Is not the mixer car shown in Photograph A the same mixer car that you used at the beginning on the pumping station foundation?

A. It appears to look a good deal the same.

X Q. 104. And has the same framework and the same loading platform over the mixer, hasn't it?

A. It looks about the same.

X Q. 105. Can't you point out on this photograph the point on the framework where you say this hand-operated block and tackle was connected for operating the boom?

A. We had a stand on one side of the mixer when we pulled on the block and tackle to raise the boom.

X Q. 106. Where was this block and tackle fastened on the framework?

A. I think it was fastened to one side.

X Q. 107. Can you not point out the approximate place on Photograph A?

[fol. 295] A. This boom appears to be longer, but in using our second equipment the block and tackle was fastened to one side of the framework, one block was fastened at the end of the boom and the other block was fastened to one side of the framework on one of the timbers.

X Q. 108. You mean over to one corner?

A. Yes.

X Q. 109. What kept the boom from swinging sidewise under the pull of the block and tackle?

A. We had guy lines.

X Q. 110. After they put the booms on the car, that is, the boom which you say was provided for supporting one of the chute sections, did they afterwards discard that boom, or an equivalent boom, and operate the apparatus to pour concrete without supporting these sections on a boom?

A. I don't recollect removing the boom, but I do recollect that at times it was not necessary to use the boom.

X Q. 111. Well, it is your recollection that after the first V-shaped boom was put on the car the apparatus was not used after that without that V-shaped boom being on the car; that is right, isn't it?

A. The apparatus was used after that with both booms on it.

X Q. 112. But after they had once installed that little V-shaped boom, they did not take that boom off and use the apparatus without the little boom, did they?

A. They may have and they may not have, as far as I know. There were times when I was on other work in that vicinity.

X Q. 113. But, so far you know, after that little boom was put on the car it was not taken off until the job was finished; that is right, isn't it?

A. It may have been removed to transport the mixer.

[fol. 296] X Q. 114. I am not asking you what might have been done; I am asking you what you remember yourself.

A. I remember that this mixer was moved from the intake for concreting the tunnel that the boom was on. The boom was in position.

X Q. 115. Both booms?

A. The long boom—I do not recollect the shorter boom.

X Q. 116. That is, they left the long boom, which is illustrated in Photograph A, on the car when they shifted it from the foundation side to the intake spout; is that right?

A. Yes, sir.

X Q. 117. And you are as sure of that as you are of any other fact that you have stated?

A. Yes, sir.

X Q. 118. Well, at that time the car had on it the side-braced mast which is illustrated in Photograph A?

A. I would not state that it was at that time according to Photograph A—it was before, I believe, the time Photograph A was taken.

X Q. 119. I am not asking you about the time when the shift was made, but about the condition of the apparatus at the time the shift was made.

A. Yes, this mast was on the concrete mixer. (Witness points to the mast on the mixer car frame to which the boom block and tackle was attached in Photograph A.) At that time that mast was not there—what I should have had in there was—at the time of concreting the intake.

X Q. 120. About how much length of the pumping station foundation was concreted at one setting of the mixer car?

A. The width of about 40 feet in a radius of a circle of about 40 [fol. 297] or 50 feet; that is, in the newer part of the work where the proper slope of the chute could be maintained, and the chute was shortened by coming to the top of the work so that we could lower the end to increase the slope of the chute.

X Q. 121. While they were concreting the foundation, how was the upper end of the first metal chute held in place to receive the discharge from the wooden trough?

A. You refer to the first operation?

X Q. 122. Yes, I mean the first operation with the wooden chute.

A. The end of the chute was supported by lines fastened to it. On different occasions we had timber support at the bottom of the chute to hold it up against the bottom of the hopper.

X Q. 123. When they were concreting the intake they used two 16 feet lengths of metal chute, lapped at their ends and tied together so as to make a single chute about 29 or 30 feet long, and at times they used a third 16-foot metal chute extended substantially parallel with the line of the intake tunnel, with its upper end in place

to receive the discharge from the lower end of the double section chute that was suspended from the boom; is that righ?

A. Yes, sir, that is correct.

X Q. 124. And when the boom was swung somewhat to one side, the lower end of this double section metal chute was tied to the upper end of the third chute, so as to hold it in place sidewise, wasn't it?

A. Yes.

X Q. 125. And in order to get the boom-supported metal chute as far as possible to one side, that boom-supported metal chute was drawn to one side of the position which it would occupy if it swung normally from the boom?

A. No, the boom was held also.

[fol. 298] X Q. 126. And held in place by guy wires?

A. No, by guy ropes or wires. In my previous answer I should have said that the boom was swung over the chute, as it was necessary in this way to hold the chute in position.

X Q. 127. About how much length of the intake tunnel was concreted at one setting of the mixer car?

A. About 50 feet or more.

X Q. 128. About how much more?

A. Either way—it depended on how much of the concrete forms were built.

X Q. 129. You mean by that about 100 feet of concreting was done at one setting of the mixer car, and the car then moved along to another position?

A. I would not say that it would be about 100 feet.

X Q. 130. How much would you say?

A. I have never measured the distance, but from my observation, passing about this work on my regular duties, it would be in the neighborhood of 60 feet.

X Q. 131. I understood you to say that you saw the apparatus shown in Photograph M the latter part of 1906; where was that?

A. In concreting the blast furnace pumping station.

X Q. 132. You mean that very apparatus there, do you?

A. It looks about the same.

X Q. 133. And you are as sure of that as you are about the other facts of which you have testified?

A. Yes, sir.

X Q. 134. In describing the construction which you say is illustrated in Photograph M, you refer to a "charging box or hopper," and I understood you to say that there was a discharge opening in the bottom of this structure; by that term "charging box or hopper," do you mean to refer to the wooden trough or chute which is be-[fol. 299] tween the two men at the upper left-hand corner of Photograph K?

A. Yes, sir.

X Q. 135. Well, that structure, instead of having a discharge opening in its bottom, is simply a trough-shaped structure with an open discharge end?

A. That charging hopper had been rebuilt while on the concreting of the water tunnel.

X Q. 136. Which came first, the wooden trough-like structure shown in Photograph K?

A. The wooden trough came first.

X Q. 137. Well, does not Photograph M show the same sort of a wooden trough which is also shown in non-operative position in Photograph A?

A. It shows about the same kind of a trough.

X Q. 138. The rebuilt structure, to which you have referred, was merely a heavier and somewhat longer trough-shaped structure of the same general character, and is the one which is projecting from the inner side of the mixer car in Photograph A; isn't that right?

A. That appears like it.

X Q. 139. After they installed the long boom, which was provided to partially support the metal chute section, how did they hold the upper end of the boom-supported metal chute section in position to receive concrete from the wooden spout or trough?

A. They built a short boom. We had various ways of holding this hopper, and it was hung on part of the frame and also on cables fastened to the outer corners.

X Q. 140. When you say "hoppers," you mean the wooden trough-like construction?

A. Yes, sir.

X Q. 141. My previous question did not refer to this wooden construction, but to the metal section which was suspended from the long boom. How was the upper end of this metal chute section supported [fol. 300] in place with relation to the discharge end of the wooden trough in order to receive the concrete, that is, when the metal section was supported in part by the long boom?

A. At one time the long chute was supported by a line from the end of the boom down to the end of the chute, and the third chute rested on the end of the long chute and was also supported there by a brace from the work, and the upper end of the long chute was supported by fastenings to the chute from the framework of the mixer, and at times it would rest on a timber that could be laid on the work, and block and tackles supported this chute from the end of the boom about half way down the chute.

X Q. 142. You have referred to a third chute in your last answer; was this the chute section which was extended substantially parallel with the forms?

A. Not necessarily. It just happened that they had to swing a third chute to get the concrete into the work.

X Q. 143. By the "third chute" you mean a final section which rested upon stationary supports and arranged at the lower end of the boom-supported chutes?

A. Yes, sir.

X Q. 144. Now, you state that at times this third chute was rested upon the lower end of the boom-supported chute?

A. Yes, sir.

X Q. 145. And could it rest on this boom-supported chute and still permit concrete to flow from the boom-supported chute into it?

A. It was fastened to it by lugs for that purpose.

X Q. 146. You do not find any such lugs in the apparatus shown in Photograph M, do you?

A. With reference to the third chute, the lugs seem to be hidden by shadows or the man standing there.

[fol. 301] X Q. 147. Now, isn't it a fact that no such construction by which the chutes could be connected together was provided in any of the Great Lakes Dredge & Dock apparatus until long after this Gary job was completed, and you just have become somewhat confused in your recollection?

A. No, sir, I am not confused as to the use of the boom; it could be boomed up or down, or swung from side to side, from which spouts could be hung for the purpose of placing concrete on the Gary work.

By Mr. Hood: The answer is objected to as not responsive and volunteered.

X Q. 148. You have stated that you saw the apparatus illustrated in Photograph B, Exhibit 17, in the summer of 1908.

A. Yes, sir.

X Q. 149. Are you as sure of that fact as you are of any other fact about which you have testified?

A. I am.

X Q. 150. Just what was the construction of that apparatus which you say you saw in the summer of 1908, as to the manner of supporting the inner end of the chute section, which was supported in part by the boom?

A. You refer to the inner end of the chute?

X Q. 151. Yes.

A. The inner end of the chute was fastened to the charging hopper.

X Q. 152. What was the construction of the charging hopper?

A. The charging hopper was constructed of wood. There was an improvement made there of a steel hopper—more or less of a chute—to allow the concrete to be held back from overlapping.

X Q. 153. You mean that there was a hopper or chute construction [fol. 302] arranged between the mixer and the boom-supported chute?

A. Yes, sir.

X Q. 154. You are right sure about that, are you?

A. Yes, sir.

X Q. 155. What type of mixer was used?

A. We were using a batch mixer.

X Q. 156. What type of batch mixer?

A. Similar to the Smith mixer.

X Q. 157. Was that a tilting mixer or a fixed body mixer?

A. I don't remember whether this mixer tilted, or whether we had a little spout that went into the spout of the discharge end of the mixer that was tilted down to run the concrete out of the mixer.

X Q. 158. You are fixing this date of the summer of 1908 from memory, are you not?

A. No, sir.

X Q. 159. How do you fix it?

A. I fix it by two incidents that happened in the year 1908, the first being that I was married on February 26, 1908, and the next that I left the employment of the Great Lakes Dredge & Dock Company about the 28th of March, 1908.

X Q. 160. And you think you saw that apparatus after you left the employ of the Great Lakes Dredge & Dock Company?

A. The floating concrete mixer, yes.

X Q. 161. And how many times did you see it?

A. I saw it practically every day that I was employed as inspector for the Illinois Steel Company during the summer of 1908.

X Q. 162. What is your recollection of the earliest date on which you saw that apparatus in 1908?

A. About the middle of the summer.

[fol. 303] X Q. 163. In what condition was it when you first saw it; was it partly completed or entirely completed?

A. It was entirely completed, ready for use.

X Q. 164. Was it changed at all in the construction of the mixer and boom-supported chutes from the time it was started in operation until the work on the turning basin was completed?

A. No, in general it was not changed.

X Q. 165. The mixer was always the same, was it?

A. Yes, sir.

X Q. 166. And the hanger supporting the boom-supported chute with relation to the mixer was always the same?

A. Yes, it was about the same.

X Q. 167. You never saw the precise apparatus shown in Photograph F, did you?

A. I do not remember that it was the same in reference to equipment.

X Q. 168. What part of the work at Gary is shown in Photograph B?

A. The background shows the blast furnaces themselves and the stacks and ore bridges, and the blast furnace high line to the dock, turning basin, the coke oven pumping station, the floating concrete mixer, and part of the concrete dock on one side of the coke oven pumping station.

X Q. 169. Photograph B appears to have been taken in the winter time when the snow was on the ground; is that right?

A. Yes, sir.

X Q. 170. Work was apparently in progress, however, in view of the steam arising from various points in the photograph; is that right?

A. Yes, sir, they were working on the job at the time.

X Q. 171. Now, this shows part of the work in the winter following [fol. 304] the time when you first saw this apparatus, doesn't it?

A. Not of the same year.

X Q. 172. Of what year?

A. That pumping station was put in in 1909, and the year before the concrete work was being done on the west side of the harbor, and that would be a few thousand feet from where this mixer started in work.

X Q. 173. The structure that is illustrated in Photograph B, in so far as the mixer and boom-supported chute are concerned, is the same as it was when you first saw this apparatus, isn't it?

A. Yes, just about—no, not when I first saw it.

X Q. 174. What is different?

A. When I first saw the mixer, the first time we used it, we had a hopper at the discharge end of the mixer.

X Q. 175. And that hopper was discarded?

A. That hopper was discarded; it did not work successfully.

X Q. 176. About how much length of concreting was done with this apparatus of Photograph B at each setting of the scow?

A. Probably 25 feet.

X Q. 177. And then they would shift the moorings of the scow to a new position?

A. Yes, sir.

X Q. 178. You have stated that it was common practice for photographs to be taken at the Gary work during its progress; about how often were these photographs taken?

A. Quite frequently.

X Q. 179. Every week?

A. No, I think sometimes there would be a couple of photographers down there from the Steel Company, and photographers from the [fol. 305] Great Lakes Dredge & Dock Company.

X Q. 180. It was the practice to keep very close track of the progress of the work by making sufficient photographs of it, wasn't it?

A. I think it was.

X Q. 181. At the time the work on the blast furnace pumping station was going on, what other concreting work was being carried on?

A. The concrete dock was being done at the same time.

X Q. 182. But your work kept you at the pumping station and intake most of the time, didn't it?

A. At first.

X Q. 183. That is, until after the intake or water tunnel had been started?

A. No, sir, I was on the concrete dock.

X Q. 184. That is, you were at work on the concrete dock before you began work on the water tunnel?

A. Yes, sir.

X Q. 185. You were around the work at the blast furnace pumping station quite frequently, however, were you not?

A. Yes, sir.

X Q. 186. And it is your recollection that photographs were taken quite often during that period of work on the pumping station?

A. I would say that there were several photographs taken.

X Q. 187. At several different times?

A. Yes.

X Q. 188. Of the apparatus that was used for chuting the concrete?

A. Yes, sir.

X Q. 189. About how often?

[fol. 306] A. I don't remember about how often, but I have seen the photographers down there taking pictures of the various parts of construction work going on.

Cross-examination closed.

Redirect examination by Mr. Jones:

R. D. Q. 190. In answering these questions as to the details of the apparatus used in 1906 and 1907, you did not have the photographs before you, did you, except in a few specific cases, before the end of the examination?

A. Only for references of details of construction and equipment.

R. D. Q. 191. What I mean is, when Mr. Hood asked you regarding these various details, he put the photographs aside so that you would not be influenced by them, didn't he?

A. My testimony was not influenced by the photographs when they were not before me during my testimony.

R. D. Q. 192. You have stated that you saw the apparatus of Photograph M in the latter part of 1906, this photograph bearing date of June 5, 1907; you have also stated, I believe, that the mixer of Photograph L, bearing date of March 2, 1907, is probably the same mixer as that shown in Photograph M. I ask you to refer to these photographs and see if Photograph L refreshes your recollection as to the earliest date when you may have seen the boom and chute apparatus of Photograph M in use?

By Mr. Hood: Objected to as incompetent, in view of the fact that the witness has testified that he does not recall Photograph L.

A. The latter part of November, or during December, 1906. Pho- [fol. 307] tograph L shows a mixer that we had in use in concreting the blast furnace pumping station, that is, I refer to the equipment as being similar.

R. D. Q. 193. Do you mean that the mixers in these photographs are different mixers, but of similar construction, or do you mean that it is the same mixer and car with additional parts added?

A. I believe it is the first car mixer, improved to spout the concrete with boom chutes.

R. D. Q. 194. What I am trying to find out is, whether there were two car mixers or one at this time.

A. I don't remember two, on account of being over on the dock work.

R. D. Q. 195. Will you try and explain, then, how the mixer shown, apparently, in a photograph taken in March, 1907, with no boom and chute on it, could have been seen by you equipped with a boom and chute in November, 1906, as I think you have just testified?

A. The intake for the pumping station was put in with a mixer with a boom and chute before the tunnel was concreted.

R. D. Q. 196. Then, what became of the boom and chute in the picture of March 2, 1907?

A. I don't know. I don't see it. The mixer is turned around in this picture.

R. D. Q. 197. But you have previously testified, I think, that there is no mast on the mixer in this picture; do you mean that there might be a boom on the mixer at this time?

Objected to as leading.

A. At the time this picture was taken, I was not on this work, and I do not know what they did then.

R. D. Q. 198. I understand you to testify that you saw the apparatus of Photograph M in November, 1906; this apparatus includes a mast, a boom, and a chute. How could you have seen this [fol. 308] apparatus at that time if the same mixer car in March, 1907, has no mast on it? My original question was: Does this Photograph L refresh your recollection in any way as to the date when you first saw the apparatus of Photograph M?

A. It does not seem to refresh my memory.

R. D. Q. 199. Can you account for the fact that the mast seems to have disappeared in the March picture, and there is also no boom visible?

A. They may have had two mixers at that time. The Great Lakes Dredge & Dock Company had several mixers on the Gary work.

R. D. Q. 200. In Photograph K, what do you call the excavation with its wooden bracing?

A. The coffer dam.

R. D. Q. 201. What are these objects to which I point in Photographs K and M?

A. Lugs (witness points to eyelets near the end of the chutes).

R. D. Q. 202. Then, when you referred to lugs on the chute section you were talking about these curved eyelets?

Objected to as leading.

A. Yes, sir.

R. D. Q. 203. And the chute sections were sometimes fastened together by ropes passing through the eyelets, as in Photograph K?

Objected to as leading.

A. Yes, sir.

R. D. Q. 204. In Photograph B you note what is apparently a short chute projected from the mixer opening?

A. Yes, sir.

R. D. Q. 205. When you swing the boom to move the chute to one side or the other at an angle to its normal position, what is there [fol. 309] to prevent the concrete flowing from the short chute in the mixer from spilling out of the swinging chute?

A. The short chute was operated by one man, who tilted it more or less to increase or decrease the amount of concrete in discharging the concrete mixer, to keep the concrete from running over the sides of the chute.

R. D. Q. 206. What I mean is, if the chute is swung to one side, why does not the concrete over-chute it entirely?

A. Because there was enough leeway in the end of the chute to swing that.

R. D. Q. 207. Explain a little more fully what you mean by leeway.

A. That there was enough room at the end of the spout to shift it over so that the concrete could be poured from the short spout.

Recross-examination by Mr. Hood:

R. X Q. 208. As far as you know, during the work on the blast furnace pumping station foundation and the adjacent water tunnel and intake, the same mixer car was used throughout?

A. With its improvements.

Signature waived.

ALEXANDER C. PATTERSON, a witness produced, sworn, and examined on behalf of defendants, deposes and testifies as follows in answer to questions by Mr. Jones:

Q. 1. Please state your name, age, residence and occupation.

A. Alex. C. Patterson; fifty-two years of age; 223 N. Fairfield Avenue, Chicago, Illinois. I am a photographer.

[fol. 310] Q. 2. Where were you employed in 1906 and 1907?

A. I was official photographer for the Indiana Steel Company at Gary, Ind. I believe subsequently they called it the Illinois Steel Company of Gary, Ind.

Q. 3. I call your attention to photographs K, L and M, Defendant's Exhibit 17, and will ask if you can identify them?

A. I can. K is numbered 85 and shows the excavation for the pumping station in its early stages; L is numbered 125 and shows the bulkhead end of the two intakes at the channel end; and M, numbered 178, shows the progress in the section of two 10″ intakes between the power house and bulkhead or channel end of the intake.

Q. 4. Who took these pictures?

A. I photographed them myself.

Q. 5. When were they taken?

A. No. 85, or Exhibit K, was taken December 31, 1906; L was made March 2, 1907; and M was made June 5, 1907.

Q. 6. You are basing these statements on the dates appearing on the photographs; is that right?

A. Yes, sir.

Q. 7. What was your practice with reference to dating photographs?

A. After making the exposure of the negative I made a note in the field book showing what the photograph would be, and in each of these trips for making photographs the date was always written in the field book with the numbers of the negatives and description following.

Q. 8. When did you put the dates on the plates?

A. The day following making the exposure the negatives were developed, and as soon as they were dried the numbers and dates were put on the negatives.

Q. 9. How recently have you seen these three negatives?
[fol. 311] A. Within fifteen minutes, at the office of the vice-president of the Illinois Steel Company, Continental & Commercial National Bank Building, Chicago.

Q. 10. And are these prints accurate reproductions of the negatives?

A. They are.

Q. 11. Did you examine any other prints in that office?

A. While I was there I looked through a part of the files showing other work of the pumping station coke ovens, which were located on the turning basin.

Q. 12. Did you see any prints of the three negatives referred to, aside from these?

A. I saw duplicates of these same photographs in the files of the Illinois Steel Company—the office photograph file, showing progress work on the pumping station and intakes of the Illinois Steel Company's Gary plant.

Q. 13. Do you recall the apparatus shown in photograph M?

A. I do.

Q. 14. Do you recall the details of it?

A. No, it was there, but I do not know anything about the details.

Q. 15. Who took photograph 967, December 18, 1909, in album 37 of Great Lakes Dredge & Dock Company?

A. I did.

Q. 16. Whose name appears on the back of this print?

A. My name.

Q. 17. Did your name also appear on the three prints, duplicates of K, L and M, in the file of the Illinois Steel Company?

A. It did.

Q. 18. When did you take this picture 967, which is reproduced as photograph B, Defendants' Exhibit 17?

A. December 18, 1909.

Q. 19. For whom did you take this photograph B?

[fol. 312] A. For the Illinois Steel Company.

Q. 20. Do you know whether the Great Lakes Dredge & Dock Company had a photographer?

A. Well, they had a whole lot of photographic work done by a man whose name was Christie. I understand he was their official photographer.

Q. 21. Is he living now?

A. I believe he is dead.

Direct examination closed.

Cross-examination by Mr. Hood:

X Q. 22. You do not know of your own knowledge that Mr. Christie made photographs for the Great Lakes Dredge & Dock Company?

A. No.

Deposition closed.
Signature waived.

Chicago, February 5, 1921.

Parties met pursuant to adjournment. Present as before.

By Mr. Jones: The book of the George M. Moulton & Company, Chicago, entitled "Grain Elevator Construction," is marked for identification "Defendants' Exhibit 28."

By Mr. Hood: The exhibit is objected to as irrelevant and immaterial and as not properly proven.

It is hereby stipulated that the two counsel for the opposing parties visited the office of the vice president of the Illinois Steel Company, Continental and Commercial National Bank Building, Chicago, Wednesday morning, February 2nd, and interviewed Mr. Moe regarding the photographic records, and that if said Moe were called [fol. 313] as a witness he would testify that he has been connected with said company since July, 1907, and that said company maintained current files showing the construction of the steel plant at Gary, these photographs bearing dates and being arranged chronologically in an album which includes duplicates of Photographs K, L, and M, Defendants' Exhibit 17; that said three duplicate photographs have been included in said record since approximately the dates shown thereon; and that three photographic plates corresponding to said photographs are also in its files.

Carl T. Anderson, a witness produced, sworn, and examined on behalf of defendants, deposes and testifies as follows in answer to questions by Mr. Jones:

Q. 1. Please state your name, age, residence and occupation.

A. Carl T. Anderson; fifty-five years; 240 Arlington Avenue, Elmhurst, Illinois. I am a civil engineer with the Webster Manufacturing Company, Chicago.

Q. 2. How long have you been with that company?

A. I have been with the Webster Company twice. For the last two years I have been with the concern, and I was with them in 1892 and 1893.

Q. 3. Are you familiar with Defendants' Exhibit 12?

A. Yes; it is a catalogue of the Webster Manufacturing Company, dated 1901.

By Mr. Hood: Objected to as relating to matter not properly pleaded.

Q. 4. What is the business of your company?

A. They are manufacturers of transmission machinery, grain elevator machinery, and conveying and elevator machinery in general.

[fol. 314] Q. 5. Have you a drafting department?

A. Yes, sir.

Q. 6. Is there anyone now in the drafting or designing depart-

ment of your company who was with it during the period from about 1900 to 1907?

By Mr. Hood: Question objected to, as the witness apparently is not qualified to answer, having stated that he was in the employ of the Webster Manufacturing Company during 1892 and 1893, and during the "last two years."

A. No.

Q. 7. Has your company ever made and sold grain spouts?

A. Yes.

Q. 8. Can you produce any tracings illustrating such spouts?

A. Yes, I can. I have here tracing G-581, dated April 9, 1900, showing grain spouts for the East Side Iron Elevator at Toledo, Ohio. I have got another tracing, G-575, showing a grain spout furnished the Great Northern Elevator at Duluth. I have also got drawing G-1184 showing dock spout furnished to George P. Swift & Co. for use at the Illinois Central elevator E at New Orleans, La. For the same concern I have got drawing G-1180 showing details of the dock spout mentioned on the previous tracings.

By Mr. Hood: No objection will be made to blue-prints of these tracings instead of the originals. Other proper objections will not be waived.

By Mr. Jones: The notary is requested to fasten together the blue-prints of these tracings, and to mark them collectively "Defendants' Exhibit 29."

Q. 9. Have you ever seen an elevator of the East Side Iron Elevator Company, including the apparatus shown on the print G-581? [fol. 315] A. I have seen that elevator a great number of times at some little distance away. I have never examined the house from the inside. I have seen those grain spouts on the house.

Q. 10. Please answer the same question for the remaining three prints.

A. The spout shown on the drawing G-575 I have never seen, being the grain spouts for the Great Northern Elevator at Duluth, Minnesota. The spouts shown on drawings G-1180 and 1184, for the Illinois Central Railroad Elevator E at New Orleans, I have seen, and have visited the house in question.

Q. 11. Please explain the operation of the Toledo apparatus of print G-581.

A. The function of this spout is three-fold. It has got a telescopic action lengthwise of the spout; it is capable of being raised and lowered in a vertical plane, and is also capable of revolving in a horizontal plane by means of a pivot and a boom and a collar on the turn head.

Q. 12. Have you any detail drawings further illustrating these features?

A. I have no detail drawings of that apparatus.

Q. 13. Please explain the operation of the New Orleans apparatus, print G-1184, June 17, 1905.

A. The operation of the spout shown in this drawing is in general the same as the functions of the spout shown in G-581.

Q. 14. Have you any detail drawings of this apparatus?

A. Yes, drawing F-825, dated June 16, 1905. This drawing shows the shop details that were used for manufacturing this apparatus in our factory.

Q. 15. Explain the details by which the spout was permitted to swing.

[fol. 316] A. The spout was permitted to swing by the use of a pivot at the lower end of the boom and by the use of rings with double pivots connecting the spout to the grain outlet spout of the elevator. The upper end of the grain spout on drawing 825, which I mark 1 in red pencil, is provided with a cast-iron ring, which I mark 2, riveted to the upper end of the spout. This ring is provided with two lugs, marked 3, provided with a hole for a round pin. Another ring, which I mark 4, is provided with holes for four round pins, two of which holes are connected to the ring 2 by means of a pin. The other two holes are connected by means of a link 5, fastened to the outlet spout of the elevator; and by this means the spout can be tilted in two directions—outwards or sidewise.

Q. 16. Please explain the boom details on this print.

A. The boom, which I mak 6, is provided with a pivot—this particular detail drawing F-285 I am not particularly acquainted with—at the lower end fastened to a yoke supported from a building or a trestle forming part of the structure of the elevator or gallery. This boom pivot pin, marked 7, on the drawing, is connected to the boom with a bolt running through the boom pivot pin and the lower part of the boom 6.

Q. 17. Where did you get these tracings that you have produced?

A. From our files.

Q. 18. What was the practice of the company with reference to making and filing tracings during the two periods you were with them?

A. The first period I was with the concern it was very small, and we had the ordinary method, consisting of drawings. At present we have a librarian in charge of our files, and these drawings were produced by the librarian at my order.

[fol. 317] Q. 19. You have stated that you had not seen the particular Great Northern apparatus of print G-575; have you ever seen such apparatus elsewhere?

A. Yes. I have seen such apparatus on a number of elevators.

Q. 20. When?

A. The latter part of last year. I saw it on the South Chicago elevators, and have seen any number of them.

Q. 21. Have you ever seen such apparatus used prior to 1907?

A. I have.

Q. 22. In such apparatus what is the part which I mark "R" with a red pencil on this print?

A. That is our turn head ring.

Q. 23. Please sketch the details of this ring on the blue print with red pencil.

A. I have made a sketch showing the connection between the grain outlet spout from the elevator and the turn head part of the grain spout by means of a simple split ring, which permits the lower part to turn around horizontally from the outlet spout from the elevator.

Q. 24. How does the spout move up and down?

A. By means of a hinge H fastened to the turn head and to the upper part of the grain spout.

Q. 25. Does your catalogue illustrate any such device as you have sketched?

A. Yes, on pages 240 and 241 of Catalogue M of 1901.

By Mr. Hood: The volunteered portion of the answer is objected to as irrelevant and immaterial.

Q. 26. You have described two different swivelled connections for grain spouts; have any other types of swivel connections ever been used in this connection prior to 1907?

[fol. 318] By Mr. Hood: Objected to as relating to matter not properly pleaded.

A. Not that I know of prior to that time.

Q. 27. Is the seat for the pivot pin of the boom in print G-1184 in fixed vertical position, or is it movable?

A. Fixed vertical position.

Q. 28. Prior to 1907, do you know whether booms were ever used in which the pivotal support could be raised vertically?

A. I could not specify any instance where I have seen them, because the practice of having a changeable support is so common that I could not be sure of having seen them before that date.

Q. 29. Have you ever seen any other apparatus similar to that shown in detail in this print, other than on the New Orleans elevator?

A. I have.

Q. 30. Were any such instances prior to 1907?

A. I could not be sure about that—I could not make a definite date on that.

Q. 31. In apparatus of which this particular print is typical, was the angle of the boom fixed or could it be changed?

A. Fixed.

Q. 32. Prior to 1907, had you ever seen inclined pivoted booms used in which the angle could be changed?

A. Yes, not for grain spouts, but for other purposes.

Q. 33. Is the general practice in grain spout construction to maintain the boom at a fixed angle, or to provide means to vary it?

A. The usual practice is to leave it at a fixed angle.

Q. 34. What are these additional blue-prints that you have before you?

A. Drawing G-1198 shows a dock spout, the upper end of which is [fol. 319] provided with a swivel ring fastened to the spout by means of a lug, so that the spout can be moved in two directions—horizontally and vertically. Drawing G-1651 shows a dock spout without

any connection to the swivel or turning part of the house shown on the drawing.

By Mr. Jones: These two blue-prints and the previously mentioned print F-825 are also marked to be included as part of Defendants' Exhibit 29.

By Mr. Hood: These blue-prints G-1198 and G-1651 are objected to as not properly identified and as irrelevant and immaterial.

Q. 35. Describe briefly the arrangement at the large end of the spout in print G-1198.

A. The upper part of the spout is fastened by means of a lug to a horizontal ring supported on a casting allowing the ring and the spout to turn together, the spout at the same time, through the lug, being allowed to swing in a vertical plane.

Q. 36. Are these details the same or different from the two swivel connections you have previously described?

A. The details are different, but the general principle is the same as the one described.

Q. 37. Have you ever seen in use apparatus such as shown on these two blue-prints?

A. I have.

Q. 38. Have any such instances been prior to 1907?

A. That is beyond my recollection—I could not identify the date.

Q. 39. Who made the drawings from which these three blue-prints just referred to were made?

By Mr. Hood: Objected to as incompetent, no showing having been made that this witness has any knowledge.

A. I couldn't say.

[fol. 320] Q. 40. I meant what company made the tracings.

By Mr. Hood: Objected to as incompetent.

A. The Webster Manufacturing Company.

Q. 41. Do you know where these blue-prints came from, G-1198 and G-1651?

A. Yes, from the Witherspoon-Englar Company, Chicago.

Q. 42. What were they doing there?

A. Mr. Englar told me that he received those blue-prints from us to use in some litigation at the time these blue-prints were marked "October 7, 1916."

By Mr. Hood: The last answer is objected to as hearsay.

Q. 43. Referring to your Company's Catalogue, Exhibit 12, about what proportion of the devices illustrated therein have actually been made and sold?

By Mr. Hood: Objected to as relating to matter not properly pleaded.

A. All have been made and sold.

Q. 44. I call your attention to an additional blue-print, and will ask if you have ever seen apparatus such as illustrated therein?

By Mr. Hood: Objected to as relating to a print not properly proven.

A. Yes, I have seen such apparatus used.
Q. 45. For what was it used?
A. Similar to those for coal, ashes, stone, or various purposes.
Q. 46. This print is marked "Steel Dock Spout and Connections Coal Handling Plant, Baltimore & Ohio Railroad;" have you seen this particular plant in operation?
A. I have not.
[fol. 321] Q. 47. Were those plants which you have seen observed by you prior to 1907?
A. Yes.
Q. 48. Please compare the operation of those plants you have seen with those of the print.
A. The spout swings in a vertical plane and by details, varying according to the requirements of the plant, may be made to have motion in a horizontal plane.

By Mr. Hood: Answer objected to, inasmuch as the construction is not properly pleaded.

Q. 49. As an engineer, what information does this blue-print give you as to the manner of swinging the spout in a horizontal plane?

By Mr. Hood: Objected to as incompetent.

A. It works on a pivot at the upper end.
Q. 50. Please point out the pivot on the blue-print.
A. Here (witness indicates the "Spout Bolster").

By Mr. Jones: The notary is requested to mark this blue-print for identification "Defendants' Exhibit 30, Baltimore & Ohio Coal Dock Spout."
By Mr. Hood: Objected to as irrelevant, immaterial, not properly pleaded, and as not properly identified.

Q. 51. Can you produce any records with reference to the manufacture or sale by your company of any of the devices you have been testifying about?
A. I have a copy of a bill here, to the Eastern Railway of Minnesota, for spouts furnished the Great Northern Elevator Company, West Superior, Wisconsin, dated April 13, 1901, bill No. 1373, order D-1410.

By Mr. Hood: Objected to as incompetent, the witness not having testified that he was with the company at the period of this bill.

[fol. 322] Q. 52. How do you identify this bill with any particular apparatus?
A. By the notes on one of these drawings—drawing G-575—which has written on it faintly "Great Northern."

Q. 53. Have you any other records?
A. Here is the record of our shop order for spouts furnished the East Side Iron Elevator Company at Toledo, Ohio, dated April 17, 1900. This book is a press copy book of the written orders issued to the shop, page 117 and following pages.

By Mr. Hood: Objected to as incompetent for reasons already stated.

Q. 54. Where did you get these two books?
A. Out of our files vault.

By Mr. Jones: These records are submitted to Mr. Hood for inspection.

Q. 55. Is the party at the Webster Manufacturing plant now who made the original long-hand entries on these records that you have referred to?

By Mr. Hood: Objected to as incompetent, the witness not having shown any knowledge as to who made the records.

A. I don't know whether the man is with the company or not.
Q. 56. Will you please find out?
A. I will.
Q. 57. What other data appears on the bill No. 1373?

By Mr. Hood: Objected to as incompetent.

A. "16 spouts as per blue-print $110.00. $1,760.00 all as per letters of March 13 and 15 F. O. B. Chicago, Bellinger spouts."
Q. 58. If there is anything on page 117 of the press copy record relating to grain spouts, please refer to it.

[fol. 323] By Mr. Hood: Objected to as incompetent.

A. A reference made to drawing G-581 as the drawing to which the spouts have to be made up; also "1-12" c. i. dock spout turn head, built with clip ring," and the entire page and following pages.
Q. 59. About how many swivel spout heads permitting movement of the grain spout both vertically and horizontally would you say you had seen prior to 1907?

By Mr. Hood: Objected to as irrelevant and immaterial.

A. I have seen dozens of them, I couldn't specify any exact number.

Direct examination closed.

Cross-examination by Mr. Hood:

X Q. 60. Mr. Anderson, you have personal knowledge of production of the tracings from which these various blue-prints about which you have testified were made; have you?
A. Just what do you mean? The only knowledge I have is that

these are part of the records of the Webster Manufacturing Company and made by the Webster Manufacturing Company.

X Q. 61. Then, you do not know of your own knowledge that the tracings were made by the Webster Manufacturing Company, or that they were made at any particular date; do you?

A. I do not.

X Q. 62. You were not in the employ of the Webster Company during the years 1900-1907, inclusive, were you?

A. I was not.

X Q. 63. In the construction shown in blue-prints G-1184 and F-825, the ring which you numbered 2, carrying the ears, marked [fol. 324] 3, was rigidly fastened to the upper enlarged end of the grain spout which you marked 1, with the axis of the pins marked 3 at right angles to the axis of the spout and parallel with the face of the building and horizontal; that is right, isn't it?

A. Yes.

X Q. 64. And the ring which you have marked 4 was pivoted to parts which you call "links" 5, these so-called "links" being attached to the inclined delivery spout, which is indicated by dotted lines in print G-1184; is that right?

A. That is correct.

X Q. 65. Well, those parts which you call "links" were rigidly attached to the inclined delivery spout (indicated by dotted lines in print G-1184) and were not capable of any swing relative to that delivery spout; that is right, isn't it?

A. Yes, sir.

X Q. 66. So that those parts 5 were ears rather than links?

A. Part 5—you may call them ears if you like, don't make much difference.

X Q. 67. Now those ears or links were placed so as to afford a pivotal axis which was horizontal and at right angles to the face of the building, thus permitting the ring 4 to pivot about a horizontal axis at right angles to the building; is that right?

A. Yes, sir.

X Q. 68. And at right angles to the pivotal axis of ring 2?

A. Yes.

X Q. 69. And that ring 4 embraced the lower end of the short downwardly inclined delivery spout which was rigidly connected to the building?

A. Yes, sir.

[fol. 325] X Q. 70. The amount of swing of ring 4 about its axis on the ears 5 was quite limited, wasn't it?

A. Somewhat limited, depending on the size of the rings you would use.

X Q. 71. But in any case could that swing amount to anywhere near 90° from the normal horizontal position?

A. I couldn't say that offhand how much it would amount to.

X Q. 72. Well, don't you know as a matter of fact, Mr. Anderson, that that swing was limited, owing to the fact that the ring 4 embraced the lower end of the inclined stationary spout, that limitation

being due to the fact that no matter what the oblation of the ring 4 might be, that ring would contact with the fixed spout and being prevented from swinging through an angle even approximating 180°?

A. There is a limitation to the swing, but how much I couldn't say offhand.

X Q. 73. Now, in this particular construction ring 4 was oblated along the line at right angles to the pivotal axis which it furnished for ring 3, only an inch and seven-eighths, wasn't it?

A. About two and a half inches.

X Q. 74. You read the external or outside dimension of the oblated portion of ring 4 as thirty-two and seven-eighths, do you?

A. I do, yes.

X Q. 75. The external diameter of the short inclined fixed spout, indicated by dotted lines in print G-1184, approximated the short internal diameter of ring 4, that is approximated twenty-seven and three-quarter inches; didn't it?

A. I don't know; the drawing does not show any dimension on this inclined spout.

X Q. 76. You don't know anything about this particular con-
[fol. 326] struction, except what you find on the drawings; do you?

A. I have seen them, but those thing are almost hidden when you see them under the hood, that is, a hood to protect them from the weather.

X Q. 77. Now, referring to print G-1184, it is true, is it not, that any swing of the boom-supported delivery spout away from the plane of the drawing of print G-1184 would cause a rise or elevation of the lower end of the boom-supported spout?

A. Yes, most decidedly so.

X Q. 78. With a fixed length of the boom-supported chute, you could not with this apparatus cause the lower end of the boom-supported chute to sweep in a horizontal arc?

A. No.

X Q. 79. In the structure shown in the print of the Baltimore & Ohio coal dock, the external lateral dimension of the fixed inclined chute was four feet, and the inside dimension of the upper end of the swinging chute laterally was about four feet, six and a half inches; wasn't it?

A. Yes.

X Q. 80. And the parts were so arranged that the lower end of the fixed chute, which was four feet wide, projected down into the upper end of the swinging chute, which was four feet, six and a half inches, and that projection amounted to about half of the height of the upper chute, or, in other words, about a foot; is that right?

A. That is correct.

X Q. 81. That arrangement limited the possible lateral swing of the swinging chute to an arc very considerably less than 180°, didn't it?

A. Yes.

Cross-examination closed.

[fol. 327] Redirect examination by Mr. Jones:

R. D. Q. 82. Will you try and find out the present address of the party who made the tracings from which these various blue-prints were made?

A. That is an impossible thing. We have most likely lost the records of this man, except the initials on the tracing.

R. D. Q. 83. Mr. Hood suggested in a question that the ring 4 embraced the spout projecting from the elevator, to which you agreed; explain a little more fully what you meant.

A. The meaning was not that the plane of the ring 4 would be in the same plane as the ring 2. It may be at such an angle as the construction will permit it to be with ring No. 2.

R. D. Q. 84. What would be the relation of the lugs 5 to the structure just referred to?

A. That question I am not able to answer, because our drawings do not show it. It would require a personal examination of the job to find out the exact location, the reason probably being that the holes for these lugs 5 were probably drilled in the field.

R. D. Q. 85. Then when you say "embracing," you do not mean closely surrounding?

A. No, not at all, it has got to be loosely surrounding.

R. D. Q. 86. In actual practice, how far do these grain spouts, such as illustrated in these various blue-prints, swing from side to side?

A. In the New Orleans job the horizontal motion of the spout is limited by the construction of the spout; in the other types referred to the horizontal motion is only limited by the buildings adjacent to it.

R. D. Q. 87. In the New Orleans job how close did the spout swing to the side of the grain elevator?

[fol 328] A. Fold tightly up against the side of the grain elevator in the plane of the spout, with such angle as you would get out of the possible swivel that you have in there.

R. D. Q. 88. Can you give some rough idea of the side swing with the spout up in discharging position?

A. The side swing would be sufficient so that you could discharge grain at either side of the hatchway in the ship. The hatchway will vary all the way from 10 feet to probably 20 feet.

R. D. Q. 89. Referring to your answer to Q. 79, which has just been read to you, explain why the arc would not be horizontal.

A. Yes, you were swinging on an arc.

R. D. Q. 90. The question was, why does the arc not remain in a horizontal plane? For example, if the cable from the top of the boom to the spout were a steel rod, instead of a flexible connection, making a rigid structure out of the boom and spout, would not this rigid structure swing about a substantially vertical axis, passing through the boom pivot and one of the pivots at the upper end of the spout?

A. I think not.

R. D. Q. 91. Does the compass joint at the upper end of the spout permit movement in all directions?

A. It does.

R. D. Q. 92. But your point is that it doesn't permit rotation of the spout about its longitudinal axis with reference to its support?

A. That is it.

Redirect examination closed.

Recross-examination by Mr. Hood:

R. X Q. 93. Mr. Anderson, when you say that this compass joint permits movement in all directions, you do not mean that the joint [fol. 329] is as flexible as it would be if it had a third pivotal axis, and it is for that reason that the delivery end of a boom-supported chute cannot be made to describe a horizontal arc?

A. With this construction it cannot.

Deposition closed.
Signature waived.

St. Louis, Missouri, February 10, 1921.

Met pursuant to notice.
Present: George Bayard Jones, for defendants.

GEORGE W. HERTHEL, another witness called on behalf of defendants, being duly sworn, testified as follows:

Direct examination by Mr. Jones:

Q. 1. Please state your name, age, residence and occupation.

A. George W. Herthel; age, forty-one; vice president and treasurer Selden-Breck Construction Company, St. Louis, Missouri.

Q. 2. Will you please describe the nature of the work carried on by this company?

A. We are general contractors and carry on building construction. Mostly fire-proof buildings. We have been in the business since 1904 and do annually a business of about four million dollars.

Q. 3. Are you familiar with the use of chutes for distributing concrete?

A. Yes, I am.

Q. 4. When did you first see such apparatus?

A. We have a particular instance where we used the chutes in constructing a reinforced concrete building. This was back in 1908. I refer to the Tootle-Campbell Building, St. Joseph, Missouri.

[fol. 330] Q. 5. What records have you with reference to this work?

A. We have the regular progress photographs of this work during construction as well as our detailed reports, contracts, subcontracts and so forth.

(Witness produced three photographs marked X Y Z, dated respectively 8-14-08, Aug. 29-08, and 10-16-08.)

Q. 6. Please compare these photographs with Defendants' Exhibit 14.

A. These are copies of the three photographs just referred to.

Q. 7. Where did you get these photographs?

A. These photographs among others were taken at our direction by a local St. Joseph photographer, Edward Pollock. These prints were taken from our progress files.

Q. 8. How long had they been in your file?

A. They were taken during the progress of the work in 1908, taken every two weeks, and have been in our files ever since with the exception of the time they were furnished to Mr. Wilbur Jones a few months ago.

Q. 9. Have you personal knowledge of these facts you have just stated?

A. Yes.

Q. 10. Did you personally see this building under construction?

A. I visited St. Joseph during its construction. I would say about three times, possibly four, I am sure of three visits.

Q. 11. Please describe briefly the distributing apparatus shown in these photographs, Defendants' Exhibit 14.

A. The concrete is mixed on the ground and hoisted to the level where it is needed by use of the tower and the hopper would travel [fol. 331] up and down. The tower is connected with movable spouts which distribute the concrete in the forms where it is needed.

Q. 12. What is this object on the upper end of the movable spout?

A. That is what we call a hopper.

Q. 13. Describe the difference between this hopper and the one which you stated moved up and down.

A. It is merely a bucket like arrangement which is loaded on the ground floor where the concrete is mixed, then it travels up to what we call the distributing hopper. When it reaches that point it is operated by a trip, which dumps it into the distributing hopper, from which it passes down the chute and is distributing where it is needed. A man is usually stationed at this point of the distributing hopper, by which I mean the hopper which is in turn connected with the spouts and this man raises and lowers the trap door controlling the flow of concrete down the spout.

Q. 14. I call your attention to the bottom photograph, Sheet 2, Defendants' Exhibit 2, and ask you if you are familiar with the structure shown therein?

A. Yes, I recognize that as the picture of the Tootle-Campbell Building, St. Joseph, Missouri, under course of construction.

Q. 15. About when would you say that photograph was taken?

A. I would say in the latter part of July, 1908.

Q. 16. In addition to this photograph, what other record have you inspected relating to this building?

A. Our detailed reports and the ledger account, and the original contract with the owner and various sub-contracts.

Q. 17. What year is indicated by these records?

A. 1908.

[fol. 332] Q. 18. Was the distributing hopper always at the same height during the erection of the building?

A. No, as the building progressed upward, the tower was naturally raised so as to allow the conveyor to travel farther, of course, the distributing hopper was naturally raised.

Q. 19. What proportion of the floor area was reached by these chutes that you have referred to?

A. Off-hand, I would say, 90 per cent.

Q. 20. How was it possible to reach the different parts of the floor area?

A. By moving the chute and by swinging the hopper around. The hopper has a place where it discharges and the chutes are fastened under that and in order to put concrete in one end of the building you would have to have the hopper located with the opening pointing that way and the chute hooked on to it in that direction. If you put it at the other end of the building you naturally would have to turn the hopper and turn the chutes.

Q. 21. Explain more fully what you mean by swinging the hopper.

A. I do not mean that the hopper swings, I mean that the chute swings and that the hopper is stationary.

Q. 22. On photograph Y, dated August 29, 1908, what is the purpose of the inclined cable extending from the left-hand side of the tower?

A. That is to guy the tower.

Q. 23. What are the vertical lines hanging from it?

A. It indicates that when they pour the concrete on that portion of the slab they guyed the spout to this line.

Q. 25. Was his apparatus successful in use?

A. Yes.

Q. 26. Have you ever seen a similar apparatus used on other buildings?

[fol. 333] A. Yes, at various times. I can say from 1908 until the present time.

Q. 27. Now, then, in all instances have they been connected with work that your concern was handling?

A. Yes, it is the customary way of handling concrete.

Q. 28. Do you know where the original plates are from which these pictures were taken?

A. I presumed that they were in the hands of Edward Pollock, commercial photographer, who took the pictures. Until recently I naturally thought Edward Pollock the commercial photographer who took these pictures had these negatives, but I recently saw a letter which indicated that he was out of business and that the negatives had been lost or destroyed.

Q. 29. Under what conditions are apparatuses of this character used today?

A. An apparatus of this kind is used wherever there is sufficient area of concrete to justify the expense of putting up a rig of this nature. In other words, if you have not got enough concrete to make it cheaper for you to do it in this fashion, why you would

naturally handle it in another manner such as by labor and by wheelbarrows.

Q. 30. In addition to this catenary suspension type and wheelbarrow distribution, what other methods of distribution are used today?

A. I do not understand your question. There are two methods of distributing concrete, one by simply wheeling it to place and the other by chuting it to place. The chute may be controlled by either swinging to overhead guy line or by boom derrick or by trestles set under it to hold it in place.

Q. 31. How many of these different methods are in use today?

A. They are all in use today and combinations of both of the [fol. 334] various types are used. That combination type is illustrated by the job now going on at Sixth and Olive Streets, this city, where it can be seen the contractor is holding up his chute both by means of trestles and by derrick, operating the cable suspended with the boom arrangements.

Q. 32. Which is more used today?

A. I would say that it is about an even break. It is a matter of choice with the contractor. It depends on what kind of an outfit he happens to have.

Q. 33. During the last twelve years, where have contractors usually obtained their outfits?

A. They buy parts such as the hopper and various machinery and in some cases they buy their towers as well from these companies that make them and also buy metal spouts at times. In a great many instances the towers are built of wood by the contractor, a different one for each job, and the spouts are built the same way, of lumber—wood. Different spous are used for each job. The hoist and the hopper is carried from one job to another.

Q. 34. In your experience do you find the same problems are encountered in the building of all buildings?

A. No, the same problems are not encountered. The question of the shape of the building and the surroundings of it influence that. You cannot use the same arrangement where you are hemmed in with stacks and guy lines and other buildings, you are bound to adopt some other plan.

Q. 35. What connection did your company have with the Tootle-Campbell Building?

A. We were the general contractors and sublet the reinforced concrete frame, to the Gillsonite Construction Company of St. Louis.

Q. 36. Where did you get the concrete distributing apparatus that you use today?

[fol. 335] A. We bought some of it and made some of it.

Q. 37. Is your practice in this respect similar to the practice you previously discussed?

A. Yes, sir.

Adjourned to February 11, 4:30 p. m.

Met pursuant to adjournment.

By Mr. Hood: No cross-examination.

Signature waived.

St. Louis, Mo., Feb. 10, 1921.

EDWARD C. GERHARD, another witness called on behalf of the defendant, being first duly sworn, testified as follows:

Direct examination by Mr. Jones:

Q. 1. State your name, residence and occupation.

A. Edward C. Gerhard, contractor. I am president of the E. C. Gerhard Building Company; reside 80 Arundel Place, St. Louis County, Missouri.

Q. 2. What experience have you had in this line?

A. Have been building reinforced concrete work since 1908, having made a specialty of large public schools, which were constructed of reinforced concrete work and made thoroughly fireproof.

Q. 3. Are you the same Edward C. Gerhard who executed an affidavit on August 7, 1920, in this case?

A. Yes.

Q. 4. Are you familiar with the chutes for distributing concrete?

A. Yes, sir.

Q. 5. What is your earliest knowledge of such apparatus?

A. Seems to me it was along in 1907 or 1908. It was in 1905 when we got the contract for the Farragut School. While that was [fol. 336] under construction I got it into my head that stuff could be spouted and I really got the idea from the grain chutes and filling stations on railroads, where they fill these tanks. We figure on work off and on and while we were figuring I planned in my head, we always plan in laying out work with this kind of apparatus. The first job that we got, the first school that we got after that, I put it into effect, using wood spouts and wood troughs.

Q. 6. On what school did you first put this apparatus into use?

A. On the Clark School, on Union and Cabanne, St. Louis, Missouri.

Q. 7. What was the date of this work?

A. It was carried on during 1908 and 1909. The construction work was started in March of 1908. The concrete was completed sometime before August prior to August first, I am sure of that, the work being carried on during the summer months. The construction was going on during the summer months. The bids on the Clark School were open January of 1908.

Q. 8. What record have you to fix this date in January, 1908?

A. The record of the contract with the Board of Education.

Q. 9. When did you design the particular apparatus used on this Clark School?

A. About December, 1907, when we were figuring on the contract.

Q. 10. Have you a photograph of the apparatus used on the Clark School?

A. That is similar to the one attached to the affidavit.

Q. 11. You are referring to the affidavit previously referred to and which was filed in opposition to a motion for a preliminary injunction in the Federal Court, Eastern District of Pennsylvania?

[fol. 337] A. Yes, sir.

Q. 12. My question was, have you a photograph of this particular Clark School apparatus?

A. We have not got a photograph of that.

Q. 13. Please describe the apparatus used on the Clark School.

A. That apparatus consisted of a wooden tower by which the concrete was lifted in a bucket from which it was automatically dumped into the hopper and from the hopper it flowed through a wooden chute; said chute being trussed. The first length of this chute was supported from a block and tackle, one end being fastened to the top of the tower and the other end to the farther edge of the chute, the chute being fastened with a swivel spout on the hopper which enabled us to move the chute as the occasion requires. At the end of the chute, which was supported by block and tackle and was further supported by a high trestle and from this trestle additional chutes were extended in order to enable us to reach the point where concrete was needed.

Q. 14. How was this hopper supported?

A. The hopper was supported by struts or outriggers built out from the tower as shown in the photograph of the Franklin School dated May 7, 1910.

Q. 15. Did the hopper remain always at the same place?

A. No; it did not always remain at the same place. We moved the hopper once. When we first placed the hopper we placed it high enough to take the foundations and the first floor slab, later on we raised the hopper in order to take care of the additional stories as the building went up.

Q. 16. How many stories was the Clark School?

A. Two stories and a basement, the Franklin School being three [fol. 338] stories and a basement, each story being approximately fifteen feet in height. This also applied to the basement.

The photograph of the Franklin School is marked Defendants' Exhibit 31, Franklin School Photograph, dated May 7, 1910.

Q. 17. Where did you get this Franklin School photograph?

A. From our records, if that is what you mean.

Q. 18. How long have you had it in your records?

A. Since May 7, 1910.

Q. 19. What is the frame shown in the left-hand side of the Franklin School photograph?

A. That is what we call number 6, that is, a trestle to support or a trestle supporting the ends of the various lengths of chutes.

Q. 20. About how many lengths of chutes did you employ on the Clark School?

A. That is pretty hard to say, we employed about five.

Q. 21. How were these lengths connected with each other?

A. Resting on trestles.

Q. 22. What was the purpose of this arrangement?

A. In order to get a continuous flow of concrete, to enable the concrete to flow to the point it ought to.

Q. 23. What percentage of the floor area could be reached with this arrangement?

A. The entire area.

Q. 24. Aside from the Clark School and the Franklin School, did you ever use a similar apparatus?

A. Yes, we used two at Erie, Pennsylvania ,about 1911 and 1912; two at Dallas, Texas, about 1915, 1919.

Q. 25. You have referred to grain elevators, where did you see such elevators prior to 1905?

A. I saw them down here on the levee and also at various stations [fol. 339] along the road while traveling over the country.

Q. 26. Are you familiar with the concrete distributing apparatus used on the American Hotel and Theatre Building in this city?

A. Only from hearsay. That came out in the trial. It came out in the defense we were preparing in a suit for infringement on a spout concrete.

Q. 27. What suit was that?

A. Our company was sued by a corporation of some sort for infringement on spouting concrete.

Q. 28. What became of the suit?

A. The suit dragged for some time and was finally thrown out of court. I think that is the disposition that was made of it.

Q. 29. Where was this suit filed?

A. In the United States District Court, St. Louis, Missouri.

Q. 30. In the Franklin School Photograph, Exhibit 31, block and tackle is shown there, near the upper end of the chute; what is this for?

A. To act as an auxiliary support.

Q. 31. Was this auxiliary used also at the Clark School in 1908?

A. No, sir.

Adjourned.

February 11, 1921—2 p. m.

Present, same as before.

Deposition of E. C. Gerhard Resumed

Mr Hood: The preceding portion of this deposition having been taken in the absence of counsel for plaintiff with his consent, it is hereby agreed that the following objections may be entered with the force and effect as though the same had been entered in due order.

[fol. 340] The answer to question 5 is objected to as relating to matters not properly pleaded.

The answer to question 9 is objected to as relating to matters not properly pleaded.

The photograph referred to in the answer to question 16 is objected to as irrelevant and immaterial because it is relating to an apparatus subsequent to the date upon which the patent in suit was issued.

Direct examination resumed by Mr. Jones:

Q. 32. Please produce and submit to opposing counsel the record on which you based your statement about the bids of the Clark School being opened in January, 1908? (Witness examines book.)

A. Should have been February——

Mr. Hood: Objected to as relating to matters not properly pleaded.

That was the day, February 12 was the date that the work was let to the Board of Education, the plans have to come out at least twenty days before the letting. We knew of the job coming out sixty days before. Really began to figure on the job sometime in December.

Q. 33. February 12, what year?

A. 1906.

Q. 34. What school are you referring to in this contract?

A. Clark School.

Q. 35. Are you sure about that?

A. Yes, sir.

Q. 36. When you testified yesterday that the bids on the Clark School were opened in January, 1908, were you testifying from recollection?

A. Yes, sir.

Q. 37. You now wish to correct that answer to read—

A. February 12.

[fol. 341] Q. 38. 1906 instead of 1908?

A. Yes, sir.

Q. 39. In whose handwriting are these entries made on this page?

A. In my own.

Q. 40. When were they made?

A. At the time that we figured on the job, at the time we put the bids in on the work, summary of the bids that we made there. I don't know whether it is proper for me to suggest, you can verify that date by seeing the contract at the Board of Education.

Q. 41. And these entries appear on pages 49 and 50 of this estimate book of yours?

A. Yes, sir.

Q. 42. How do you know that these entries relate to the Clark School?

A. By the location of the building, which is Union and Cabanne.

Q. 43. Explain a little more fully what these items are, appearing on these pages.

A. Various subdivisions of the work.

Q. 44. For example?

A. There would be the cut stone mill work, fireproofing, brick work. Want the whole list?

Q. 45. No, just a few.

A. Slate roof, plastering, painting, sheet metal work, everything that goes to complete a building except the heating.

Q. 47. The date, the year following the entry February 12, looks as if it had been written first "05" and then "06," how do you explain that?

A. I haven't any idea, never anything been done on that, since the work for the Webster School. We got that in the fall in the same year we got this one.

Q. 48. Over on the next sheet, I think.

[fol. 342] A. Yes, sir.

Q. 49. When were the other entries in this book made as to the other buildings?

A. My answer to that is, the work came; after the work came out.

Q. 50. You mean that the entries are made chronologically?

A. Yes, sir.

Q. 51. What are the dates of the entries immediately preceding and immediately following this particular Clark School page, of these particular Clark School pages?

A. The next one—earlier, will be September 14, the dates as stated. I haven't got the date on this, I don't know what job this one is, the Hempstead School, I haven't got the date of that, the date afterward was December 6, 1906.

Q. 52. Please state a little more definitely what the dates are on the following pages, 44 and 45, preceding the Clark School on pages 49 and 50, and the dates on pages 52 and 53 following the same. Give page and date.

A. Page 44, August 10, 1905.

Q. 53. What school was that?

A. Blackstone Investment Company building, Broadway and Chestnut, Pines Building. Page 45, September 14, 1905, is for Miss Curn, the owner, St. Louis and Union Avenue. Page 52 was the Clinton School, December 6, 1906; 53 was the La Salle Building, December 31, 1906.

Q. 54. Having refreshed your recollection from inspecting these records, when would you say you first used the concrete spouting apparatus on the Clark School?

A. I should say it was some time along in about the early part of May, latter part of April or early part of May.

[fol. 343] Q. 55. May what?

A. 1906.

Q. 56. Please make a sketch of the apparatus used at that time.

A. I have made it here.

Q. 57. Please describe it briefly.

A. Well, it consisted of a tower.

Q. 58. You might put numbers on the tower, 1, and so forth.

A. 1 is the tower, 2 was the hopper, 3 outrigger supporting hopper, 4 is the guy supporting chutes, 5 chutes, 6 trestles supporting chutes. Anything else you want?

Q. 59. How does the concrete get to the hopper?

A. In a bucket which runs up inside the tower, 7 is the concrete bucket.

This sketch is marked for identification Defendant's Exhibit 34, Gerhard sketch of 1906 Apparatus.

Mr. Hood: Objected to as not properly pleaded.

Q. 60. You referred yesterday to a suit against you; have you made inquiry to learn further data of this suit?

A. Yes. I called up our attorney's office, the attorney that defended the suit.

Q. 61. Who?

A. Mr. Cornwall gave me the data on the suit, who the parties were and the nature of the suit.

Q. 62. Go ahead and tell what you know about it.

A. The suit was brought by the Concrete Appliance Company against the E. C. Gerhard Building Company and Board of Education of the City of St. Louis, jointly, and claimed there was an infringement on the Callahan patent No. 948,719. The claims were on 1, 2, 5, 13 and 14. We entered our appearance on March 19, [fol. 344] 1910, and filed the answer. The suit was dismissed for want of prosecution upon the calling of the docket on September, 1911.

Mr. Hood: Answer objected to as not the best evidence.

Q. 63. What was your connection with the E. C. Gerhard Building Company?

A. President of it.

Q. 64. Since the dismissal of this suit against your company, have you continued to use your previous apparatus?

A. I have to a certain extent, my own features of it.

Q. 65. Have you ever been sued since for infringement?

A. No.

Q. 66. Please refer to the telephone book and give the address—the location of the Clark School as shown therein.

A. "Clark School, Union and Cates," runs from Cates to Cabanne, Union and Cates Avenue, Cabanne.

Cross-examination by Mr. Hood:

X Q. 67. You have intended to illustrate by this sketch which has been marked Defendant's Exhibit 34 the same sort of apparatus as is illustrated in the photograph which has been marked Defendant's Exhibit 31, have you?

Mr. Jones: I suggest the witness be shown the exhibits in question.

(Two exhibits were handed to witness.)

A. Yes.

X Q. 68. It is your recollection that the structures were substantially identical, is it?

A. As to construction, you mean as to the general construction of it?

[fol. 345] X Q. 69. Yes.

A. I understood you to say what?

X Q. 70. Read the last question.

(Last question read.)

X Q. 71. It is your recollection, is it, that the concrete chuting apparatus which you say you used in connection with the fabrication of the Clark School was substantially the same as that which you say was used in connection with the fabrication of the Franklin school and which is shown in the photograph, Defendants' Exhibit 31; is that right?

A. Yes.

X Q. 72. Did you take any photographs of the apparatus that you say you used in connection with the Clark School?

A. No, sir.

X Q. 73. I suppose you thought this apparatus was pretty ingenious one when you finished it, did you?

A. Well, yes, I don't know how to answer, just what you are driving at.

X Q. 74. Please give the names and addresses of any persons you may now recall who saw the apparatus that you say you had in use in connection with the fabrication of the Clark School at the time that apparatus was in use at the Clark School site.

A. Men that were working on the work, and one man in particular, superintendent, who is still in our employ, Tom Karas, he is not in town, in West Frankfort, Illinois.

Mr. Jones: Temporarily?

A. Be there for another year.

X Q. 75. Anybody else?

A. I said the men that were working on the building, I don't remember their names now, names and addresses.

[fol. 346] X Q. 76. Tom Karas is the only man that you now recall who had knowledge of that apparatus?

A. Yes.

X Q. 77. Still in the employ of your company?

A. Yes.

X Q. 78. You have referred to the Webster School; when was that building erected?

A. Contract was let on the sixth day of—bids were opened on the sixth day of December, 1906, I believe, that was the date right after the Clark, page 52 or 54.

X Q. 79. Was there any concrete work on this school?

A. Yes, sir, wasn't spouted, though.

X Q. 80. On page 51 of this record book, aside from entries somewhat similar to the entries on page 50, which related to the Clark School, to what do the entries on page 51 relate?

A. 51 relates to the Clark School, it is the same thing.

X Q. 81. On page 50 I see an entry, fire-proofing, $23,585.00, and on page 51 I see the entry, fire-proofing, $23,546.00.

A. $23,585.00 and $23,546.00 are the same thing, same school. Here is eleven and something for excavation; we let it at $8,250.00, $3,275.00.

X Q. 82. Is your recollection that the entries on page 50 were your estimates and that the entries on page 51 are indicating the amounts to which the subcontracts were actually let.

A. Actually let, yes.

X Q. 83. Entries on pages 46 and 47 relate to Hempstead School?

A. Yes, my recollection is that Hempstead—is that it was let either in November or December of 1905, which is a few weeks prior to the Clark School.

X Q. 84. The record book doesn't contain any date in relation to the Hempstead School?

A. No.

[fol. 347] X Q. 85. What became of the apparatus which you say you used in connection with the Clark School?

A. The tower was wrecked, the hopper and the bucket were saved for other work.

X Q. 86. You did not again use an apparatus comprising a tower and hopper and chutes until you built the Franklin School in 1910; is that right?

A. I didn't say that, no. I don't know off-hand that I didn't, I know I didn't say that.

X Q. 87. Well, as a matter of fact, did you use the apparatus or similar apparatus between the time you say you used it on the Clark School and the time you say you used it in connection with the Franklin School?

A. I have to look it up. (Examines book.) No, sir, the high school where it was let at—the Soldan High School.

X Q. 88. What do you mean by your reference to the Soldan High School?

A. I was under the impression in my former deposition I used the dates of January 10, 1908, as referring to the Clark School.

X Q. 89. Whereas in reality that date——

A. Referred to the Soldan High School.

X Q. 90. And in the Soldan High School, did you have any concrete work?

A. We did not build the Soldan.

X Q. 91. Simply estimated on it?

A. Yes, sir.

X Q. 92. Didn't get the contract?

A. Didn't get the contract.

X Q. 93. How many school buildings did you build between the time you built the Clark School and the time you built the Franklin School?

A. Built one at Gary, Indiana, 1909.

X Q. 94. Did that have concrete work in it?

[fol. 348] A. At Gary?

X Q. 95. Yes.

A. Yes, sir.

X Q. 96. Did you do any other building between the time you built the Clark School——

A. Yes, sir.

X Q. 97. —and the time you built the Franklin School?

A. Built residences or some flats, no reinforced concrete buildings.

X Q. 98. Any of those buildings have concrete foundations?

A. Yes.

X Q. 99. What was the size of the largest building built in that period?

A. I should say off-hand approximately 120 x 200, two-story and a basement.

X Q. 100. Concrete foundation?

A. Yes.

X Q. 101. What kind of walls?

A. Rubble walls.

X Q. 102. What do you mean by rubble?

A. Stone work.

X Q. 103. What kind of floors?

A. Joist construction—wood floors.

X Q. 104. What is your recollection of the date when you completed the erection of the tower in the Clark School apparatus?

A. I should say it would be about the first or middle of April.

X Q. 105. What year.

A. 1906.

X Q. 106. When did you pour the first concrete with this apparatus?

A. Say about the middle of April, poured the foundations there, very heavy foundations.

Mr. Hood: That is all.

[fol. 349] Redirect examination by Mr. Jones:

R. D. Q. 107. Prior to your testimony yesterday, did you glance over this affidavit to refresh you recollection as to the dates?

A. Yes.

Mr. Hood: Objected to as immaterial, the affidavit is not in evidence.

R. D. Q. 108. You described yesterday the apparatus used on the Clark School; please read your answer to Q. 13 and state whether or not, in view of your mistake in having originally used the date of Soldan instead of Clark School, that description applies accurately to the Clark School apparatus.

(Witness reads answer.)

A. Yes.

R. D. Q. 109. Then, in your deposition yesterday, you were in fact referring to the proper school, but merely mistaken as to the date; is that it?

A. Yes, sir.

R. D. Q. 110. Why did you not use your concrete distributing apparatus on the Webster School?

A. On account of the position that the building was in. We had built and was constructing in front of it, an old building which had been wrecked, but we completed it. We completed the new portion before the old was wrecked.

R. D. Q. 111. Was the apparatus used on the Clark School successfully?

A. It was.

R. D. Q. 112. You said that the apparatus of Exhibits 31 and 34 are substantially the same; please point out any differences which may exist.

Mr. Hood: The question is objected to as immaterial.

[fol. 350] A. You want to know if there was any substantial difference?

R. D. Q. 113. Just point out any differences which existed.

A. On the Franklin School we used, in addition to the one guy line supporting the end of the chute, we used an additional steel cable extending to the extreme corners of the lot, expecting to carry our chutes from this steel cable. When we got to work, however, we found that, on account of the weight, that the steel cables would slacken when the aggregate got in the chutes and it would stop up the flow of the concrete, and when we found this condition prevailed, we abandoned the steel cable as a support for the chutes.

R. D. Q. 114. The next time that you used the apparatus of this general character, of what did that apparatus consist?

A. Practically the same thing that we had on the Clark School.

R. D. Q. 115. And would that apparatus be fairly illustrated in Exhibit 34?

A. Yes.

R. D. Q. 116. Is there anything in the figures of your estimate of the Clark School on page 49 of the book, previously referred to, which reminds you of the kind of concrete distributing apparatus used on that school?

A. Nothing to show the apparatus, no.

R. D. Q. 117. Please answer the question. Read the question.

(Question read.)

A. Have to answer it the same way.

R. D. Q. 118. How does your estimate for the concrete work on this job compare with previous estimates for work of like character?

A. This is the first job of this kind that we did ourselves—before that we had always sublet.

[fol. 351] R. D. Q. 119. In making your estimate, did you attempt to make any comparison between the cost of distributing concrete by your proposed new apparatus as compared with any other methods in use at that time?

A. Well, when the work first came out, I figured around to see, to do away with certain amount of labor, and all that class of work that we had been doing. We kept tab of the work at it went along and we had that data and we felt by eliminating all the labor that we could and doing it by machinery, we could save money by it and we based our figures on that, expecting to use this kind of an apparatus.

R. D. Q. 120. What figures, on pages 49 and 50, relate to the concrete?

A. 23—fireproofing.

R. D. Q. 121. Fireproofing, what is the rest of it please?

A. That is all, fireproofing.

R. D. Q. 122. Just a minute, you started to read some figures?

A. Fireproofing, $235.85.

R. D. Q. 123. What is the "revised estimate" of 18315 immediately following?

A. Well, I don't know that that is a revised estimate, that isn't a revised estimate. I don't know the reason for them now, so long ago. Here is a figure and here is what the work was let for (witness indicated the estimate column of page 49) that corresponds (witness indicates the estimate column of page 51).

R. D. Q. 124. About what proportion of the concrete work of the Clark School was placed by the use of your apparatus Exhibit 34?

A. All of it.

R. D. Q. 125. On how many floors was concrete used?

A. There were three slabs; first, second and attic.

R. D. Q. 126. Please explain what you mean by slabs.

[fol. 352] A. Floor slabs, carry the floors.

R. D. Q. 127. You mean that the first and second floors and the attic were of concrete?

A. What formed the support for the first floor was a concrete slab and what formed the support for the second floor was a concrete slab; and the support for the attic was also a concrete slab. These concrete slabs cover the entire area of the building.

R. D. Q. 128. Was your concrete distributing apparatus used on the Gary School?

A. It was not.

R. D. Q. 129. Why not?

A. On account of the condition of the job, condition of the work, we tried another method there, wheeling.

R. D. Q. 130. What was the condition of the work that required wheeling?

A. The ground was in very bad shape.

Mr. Jones: Photographic reproductions of pages 49 and 50 are marked for identification Defendant's Exhibit 35, Photographs of Gerhard Estimate Book. It is stipulated that these photographs may be used with the same force and effect as the original record.

Mr. Hood is asked to state on the record how many suits have been filed in the past on this same Callahan patent involved in the present suit and the respective courts in which such have been filed.

Mr. Hood: I am not able to state from memory. There was one suit which is referred to in the bill of complaint—there is the present suit; there was a suit filed a number of years ago against the Witherspoon-Englar Company, in Chicago, which was not brought to trial because I was informed that the defendant had ceased infringing operations; there was a suit brought in the Western District of Pennsylvania against a party by the name of Hogg, the structure being one [fol. 353] which was produced by the same party who produced the apparatus which was involved in the suit referred to in the bill of complaint, and the decree in that suit was entered for plaintiff following the mandate of the Circuit Court of Appeals in the Sixth Circuit in the suit referred to in the bill of complaint; there was also a suit in the Western District of Missouri against a party whose name

was, I think, Gray, in which a consent decree was entered. I think these are all the suits of which I have had any knowledge; at least, I do not now recall any others. I never had any knowledge of the suit referred to by the present witness until today.

Mr. Jones: Did not you and your partner Mr. Schley take some part in connection with a suit brought in the Canadian courts back in 1913?

Mr. Hood: I am not on the witness stand, and I see no reason why I should respond to interrogatories by order of counsel for defendant in this case. It is a fact, however, both Mr. Schley and I were associated with the defense in the Vancouver suit.

R. D. Q. 131. In answer to question 13 you stated that the chute on the Clark School was trussed, will you please indicate this feature on your sketch Exhibit 34, if that statement is correct?

A. I have done so, and marked it figure 8.

R. D. Q. 132. About how long was this trussed section, if you remember it?

A. I should judge about thirty-five feet, first section.

R. D. Q. 133. Of what was it built?

A. Wood.

R. D. Q. 134. Of what was the truss made?

A. Wire rods.

R. D. Q. 135. You stated in this same answer that the chute was fastened by swivel spout on the hopper which enables you to move the [fol. 354] chute as the case required. Explain more fully in what direction you would move it.

A. With the swivel arrangement we could move the spout in a radius of forty-five degrees, I think you would call it, half, yes, forty-five degrees.

R. D. Q. 136. What do you mean by that "half?"

A. Half a circle.

R. D. Q. 137. During such movement, where would the trestle 6 be?

A. Trestle 6 would be moved with it as we moved the spout, we would carry the trestle on it.

R. D. Q. 138. In such cases was the weight of the chute carried by the trestle or the cable or by both?

A. Carried principally by the cable or guys as I call it.

R. D. Q. 139. Explain a little more fully how the weight was carried principally by the cable 4 or guy.

A. The figure 4 indicates the cable or guy line which was run through a block which was fastened at the tower at the top of the tower and the other end of the line reeved through a block fastened at the further end of the chute. The block support reeved in such a manner that when we wanted to raise or lower the end of this truss, we would turn it at the drum figure 9.

R. D. Q. 140. What I mean was what was the arrangement whereby the weight was carried principally by the guy as distinguished from the trestle?

A. I think my other answer covers that. The blocks and tackle through the line was reeved, one end being fastened to the outer edge

of the truss and other end at the top of the tower with a line running down to the drum. When the drum was turned it would pull the top up and the spout would practically hang of its own weight.

R. D. Q. 141. You mean it would hang clear of the—of any support furnished by the trestle 6?

[fol. 355] A. 6, trestle 6 was principally used, had to be there, in order to take extension chute 5 from the main chute.

R. D. Q. 142. Then when you would swing the main chute 5 during such swinging its weight would be carried by the guy 4, is that it?

A. That is it, yes, I have marked the extension chute 5a.

R. D. Q. 143. About how high was the tower on this Clark School apparatus?

A. I should judge about 110 feet.

Recross-examination by Mr. Hood:

R. X Q. 144. Who was the architect on the Clark School?

A. William B. Ittner.

R. X Q. 145. What was his address?

A. Ninth and Locust, Board of Education Building.

R. X Q. 146. Is he still living?

A. Yes, sir, still there.

R. X Q. 147. Was he on the job during its course of erection?

A. You mean, was he there all the time?

R. X Q. 148. From time to time as architect would be.

A. From time to time, yes.

R. X Q. 149. Did the architect have an inspector on the job?

A. Yes, sir, all the time.

R. X Q. 150. Who was the inspector?

A. I don't remember that Mr. Hood, I don't remember who the inspector was there.

R. X Q. 151. Was the concrete work done by your company or by subcontractor?

A. By our company.

R. X Q. 152. What was the size of the building, that is, the ground area, approximately?

[fol. 356] A. Pretty hard to say, I should judge about 110 by pretty near 400 feet to the best of my recollection.

Redirect examination by Mr. Jones:

R. D. Q. 153. Where is the Soldan School?

A. Across the street from the Clark, at Union and Kensington.

Signature waived.

St. Louis, Missouri, February 11, 1921—10 a. m.

SAMUEL C. BLACK, another witness called on behalf of the defendants, having been first duly sworn, testified as follows:

Direct examination by Mr. Jones:

Q. 1. Please state your name, age, residence and occupation.

A. Samuel C. Black; fifty-five years old; I am an architect; present occupation, draftsman for the Board of Education, City of St. Louis, with the building department.

Q. 2. Where were you employed in 1907?

A. Employed by Fred C. Bonsack.

Q. 3. On what structure were you employed during that year?

A. Most of the time I was on the American Theater and Hotel Building.

Q. 4. Did that—was that building of concrete construction?

A. It was of steel frame and concrete floor, reinforced concrete floors and some reinforced concrete partitions around elevators and around the fireproof stairway.

Q. 5. What apparatus was used for distributing the concrete on that building?

[fol. 357] A. The concrete was mixed by a mixer in the basement, and then hoisted to the height required at the time, on an elevator tower or hoist and dumped at that point, into a funnel attached to this same hoist, funnel-shaped there, and from that into a cylindrical tube about eight inches in diameter, sections about six feet long I guess you would say. These tubes were formed with hubs similar to the cast-iron soil pipe; of course, these were of wrought metal. They were secured together by means of wires through rings which were attached to the tubes themselves. These were supported mainly to a cable which was attached to the tower onto the end at the lower point, to some of the steel work of the building which was; the angle of this cable, was moved from time to time as required to reach certain points of the building. There were other supports, to my recollection about two, wood trestles to take some of the weight off the cable. If I am not clear on the matter of tubes, I can sketch you what my recollection of it is.

Q. 6. Please make such a sketch.

(Witness makes sketch.)

Q. 7. What proportion of this building was built by the use of this apparatus you have described?

A. The reinforced floors, reinforced concrete floors.

Q. 8. The question was what proportion.

A. I hardly know just how to answer that question. All floors were reinforced concrete throughout, that is, the structure floors.

Q. 9. What proportion of the work was done with this apparatus that you have just described?

A. Reinforced concrete work and the fireproofing of the hotel.

Q. 10. All of it?

A. All of the reinforced concrete but some of the fire-proofing [fol. 358] was done by hand where it was not handy to reach by chute, out of the way places in the lower floors had to be done by hand, small portions.

Q. 11. Who designed this apparatus you have described?

A. I was told by the foreman for the Gilsonite Construction Company, who we got on that building that it was his invention, Mr. Bankes.

Q. 12. His full name is Herman A. Bankes?

A. Bankes is the proper last name, I believe, Herman A. are his initials.

Q. 13. From what you know of Bankes, what can you say as to his qualifications as an inventor?

Mr. Hood: Objected to as irrelevant, immaterial and incompetent.

Q. 14. Just answer it any way regardless of the objection.

A. Mr. Bankes, I recall conversations which I had with him, but also by his arrangements in various places, specially in the control of the cars which he used to carry the material to the mixer, showed himself to be a very ingenious man, generally handled the work in a very capable way.

Q. 15. Describe a little more fully the car arrangements you refer to.

Mr. Hood: Objected to as irrelevant and immaterial.

A. The materials were placed in bins in the basement. These bins were loaded from the ground floor by wagons and dumped the material into them. The lower portions were funnel-shaped and under this they run steel tracks to carry the cars, were constructed to carry the proper amount of materials for a "mix," one batch as we call it. These traveled mostly by gravity. Started with loading it [fol. 359] with the material and give it a roll and by its own momentum, from there to the next bin, and from there on, rolled to the mixer. From that point, after being emptied, the car was pushed up a height sufficient to get the momentum to come back in its routine, regular run. This came back pretty fast and necessitated some means of checking the speed of the car. Bankes immediately got busy and arranged a check by means of using ordinary one-inch plank, a series of them, so that the car would strike them one after the other and it came practically to a standstill.

Q. 16. On what building was this apparatus used?

A. American Hotel and Theater Building.

Q. 17. Do you know when Bankes first got up the invention of the chuting arrangement you have referred to?

A. Only what he said to me. In our talk he said that he had invented that system and his firm was profiting greatly by it and it was his intention to take out a patent on the arrangement, get some of the profit himself.

Q. 18. Do you know when he made the invention?

A. That was claimed to have been made sometime previous to this job.

Mr. Hood: Object to that as hearsay.

Q. 19. American Theater job?

A. Yes, sir.

Q. 20. About when was the concrete work begun on the American Theater Building?

A. Have to give you that approximately, of course. The main structural concrete work must have been finished at the latter part of 1907. One point which impressed my mind was the opening of the theater. At that time all the structural work was done, the finishing was only in the theater.

Q. 21. When did the theater open?

A. Opened in February, 1908, I think the 17th.

[fol. 360] Q. 22. I call your attention to Defendant's Exhibit 1 and ask if this article describes the building you have been talking about?

A. Yes.

Q. 23. Were you fixing the date of February, 1908, by your recollection, or have you previously seen this photograph?

A. No, this was impressed on my mind very strongly, as being practically driven by the owners to open that theater at as early a date as possible, give them our promise that they should have it by that time. Of course, I had made strenuous efforts to do it. I remember it for that reason. Didn't trouble to thank me afterwards either.

Q. 24. You refer to a funnel-shaped arrangement for receiving concrete on the tower, how was this device supported?

A. It was attached to the tower, to the proper height, for the time, moved when it had been reached.

Q. 25. Why did it have to be moved?

A. To reach upper uoors, moved about every, possibly, three floors.

Q. 26. Do you know anything about the apparatus on photographs A and B, Defendant's Exhibit 2?

A. There is evidently the roof of the building. The tower in this case extends above on the structure.

Q. 27. Did this building have more than one roof?

A. No, only one main roof and the roof over between pent-houses on the top, very small between pent-houses over elevator.

Q. 28. Where was the theater with reference to the rest of the building?

A. It was in the eastern portion of the building.

Q. 29. Did the theater have a separate roof?

A. No, sir.

[fol. 361] Q. 30. About how many stories did that building have?

A. Twelve stories.

Q. 31. The photographs show the main roof of this main twelve story building?

A. Yes, sir.

Q. 32. Photographs A and B, there are some inclined members running downwardly from some part of the structure, were these inclined members used throughout the erection of the building?

A. No, they are not necessary below.

Q. 33. I don't believe you answered my previous question about when the concrete work was begun.

A. The concrete work was—the reinforced concreted work was begun shortly after June 8, 1907.

Q. 34. When was the first time you ever saw chutes of this character running from the tower to distribute concrete over various parts of a floor area?

A. I believe this was the first instance that I had noted, at least first completed one.

Q. 35. What impression did this apparatus make on you?

A. Greatly interested in it on account of its ingenuity and efficiency.

Q. 36. Was there any discussion about this apparatus?

Mr. Hood: Objected to. It is immaterial, discussion between this witness and parties not of record.

A. Quite a bit.

Q. 37. What was the substance of discussion, was it favorable or unfavorable?

Mr. Hood: Objected to as irrelevant, immaterial and incompetent, also calling for a statement of conclusion.

A. Favorable.

[fol. 362] Q. 38. Was such apparatus ever used again?

A. Similar to that, has been used almost continuously from that time to this. Various changes in it. Open chutes, wooden troughs, all kinds of things.

Q. 39. Were there any special restrictions in connection with excluding the public from this building during its erection?

A. Yes, we undertook to keep out the general public. This being what we called, at that time, a sublet job, a considerable number of people who had a right to be there.

Q. 40. The question was intended to relate—the question asked whether there were special restrictions as distinguished from the usual restrictions on such buildings?

A. Not at all.

Q. 41. Can you answer that more fully, "not at all" doesn't make sense there? Was this apparatus enclosed in any way to prevent inspection, from other buildings?

A. Not outside of the frame of it, but later after the walls were up, couldn't see anything below that. It was located towards the central portion of the building.

Q. 42. Where did the contractors usually get the various appliances that they used in carrying on their work?

Mr. Hood: I object to that as incompetent.

A. I hardly know just what you mean, Mr. Jones. The tower itself was built there on the job, ordinary lumber purchased for that purpose. The mixing apparatus was bought from some firm in that business. That would apply to all the machinery connected with it.

Mr. Hood: I object to that as hearsay.

Q. 43. Are you talking now about building work in general or some particular building?

A. All buildings of that description.

Q. 44. What was the consistency of the concrete used on the American Theater Building?

[fol. 363] A. To the best of my recollection that was what we called, one, two, four, mix.

Q. 45. Does that indicate the consistency?

A. That is the material, proportion of material from the sand and gravel in the mixer, thrown in the mixer. Sufficient water to make it flow freely in the spouting.

Q. 64. Did you see the St. Louis Coliseum under erection?

A. Yes, sir.

Q. 47. Can you identify the photographs, Defendant's Exhibits 3 and 22?

A. Those are pictures of the Coliseum building.

Q. 48. Did you personally see the concrete distributing apparatus used on that building?

A. Not particularly, I noticed it however.

Q. 49. I call your attention to Defendants' Exhibit 4, sketch by Woodman, and will ask you if the slope of the pipe or chutes therein is in accordance with your recollection of the slope of the American Theater chutes?

Mr. Hood: I object to that as incompetent.

A. No, sir.

Q. 50. Go on and explain it a little more fully.

A. They are shown too steep, would not be practical chuting the concrete at that angle.

Q. 51. I call your attention to Defendant's Exhibit 13, Webb sketch, I will ask if you ever saw this exhibit before?

A. No, I don't remember of seeing it.

The notary is requested to mark the witness' previous sketch, Defendant's Exhibit 32, Black Sketch of American Theater Pipes.

Q. 52. Please add to this sketch, Exhibit 32, the rings and wires you previously described.

(Witness does so.)

Q. 53. You state that the slope of the pipe in Exhibit 4 is too steep. [fol. 364] Sketch on this same sheet, the slope approximately as you remember it; sketch enough to show about the slope.

A. I have done so.

Q. 54. Was this slope always the same throughout the building?

A. No, sir, it varied to meet the necessity of the work. These tubes and pipes were quite flexible at the joints, only being about six feet long, permitted quite a swing without changing it.

Q. 55. Do you know Edward C. Gerhard?

A. Yes, sir.

Q. 56. Have you ever seen any of the concrete distributing apparatus which he claims to have used in building schools in St. Louis?

A. Yes, sir, I have seen them, never paid much particular attention to them. One thing I particularly noticed about his was a steel boom which he erected on one of the schools, not certain whether he used it on all the work he did or not.

Q. 57. You recall ever seeing the apparatus of Defendant's Exhibit 31, photograph dated May 7, 1910?

Mr. Hood: Objected to as irrelevant and immaterial, and as relating to certain structures subsequent to the date of the application upon which the patent in suit was issued.

A. I can't identify that particular thing.

Cross-examination by Mr. Hood:

X Q. 58. You consider Mr. Bankes whom you have mentioned, as a man of rather unusual ingenuity?

A. Yes, sir.

X Q. 59. In your opinion he possesses and exercises a great deal more ingenuity than the average workman or superintendent?

[fol. 365] A. Yes, sir.

X Q. 60. You were asked certain questions about photographs A and B of Defendant's Exhibit 2, and you stated that certain inclined members which were found in those photographs were not used below. Just what do you mean by that?

A. Below we had the steel frame work to brace to.

X Q. 61. It is a fact, isn't it, in the apparatus which was used in erecting the American Theater Building, the hopper, or, what you call the funnel, was hung out on one side of the tower and was always braced or partially supported at its outermost parts by members which extended over and were supported by the steel framework of the building?

A. That would not necessarily be true.

X Q. 62. I am asking what the fact was in that particular structure?

A. It was not always true, in some cases it was supported entirely at the tower.

X Q. 63. As a general rule it was supported—additionally supported by the steel framework, was it not?

A. No, because that would be a little bit awkward position.

X Q. 64. Are you perfectly sure of that?

A. More convenient for them to have it free.

X Q. 65. The opinions which you just expressed relative to the ability of Mr. Bankes, were also held by you relative to Mr. Bankes in 1907?

A. Yes, sir. That is when I formed the opinion.

X Q. 66. Are you sure of the date when they beagn to distribute concrete for the reinforced concrete portions of the American Theater Building?

A. I am, absolutely, that it was shortly after June 8, 1907.

X Q. 67. How did you set that date?

[fol. 366] A. Because on that date that was the date of the signing of the contract between the Real Estate and Financial Company, and the Gilsonite Construction Company.

Mr. Jones: The tracings constituting part of the contract are now on the way to this office and were not sent earlier as the architect was out of his office. It will be referred to as soon as received. It will be submitted to opposing counsel as soon as received.

X Q. 68. What do you mean shortly after?

A. Why, next few days, for this reason, that we were trying to expedite matters as much as possible, and these men had been for quite a while talking over the contract, and arranging it, and the minute that contract was signed, they were informed to get busy at once, which they did.

X Q. 69. They had to excavate for the foundation, didn't they?

A. That was all done before.

X Q. 70. The contract to which you have referred was the general contract for the building?

A. It was the contract between the Gilsonite Construction Company and the owners for the erection of the reinforced concrete work.

X Q. 71. Was this Bankes' apparatus, if you recall it, used in pouring concrete for the foundation?

A. No, sir.

X Q. 72. How long did it take to put that foundation in?

A. About two months, with the excavation and foundation.

X Q. 73. And after the foundation was in, they started to put up the steel framework?

A. Yes, sir.

X Q. 74. How far up was the steel frame before they begun to use the Bankes apparatus which you have described?

[fol. 367] A. Probably four stories, that is when— I am indefinite on that.

X Q. 75. How long did that take?

A. About, probably a month.

X Q. 76. So that it was probably sometime in August, 1907, before the foundation was completed?

A. No, sir, just told you that the foundations were completed before the Gilsonite signed the contract.

X Q. 77. Was any of the steel framework up before the Gilsonite contract was signed?

A. Yes, sir.

X Q. 78. When did they first begin to use the Bankes apparatus which you have described?

A. As soon as it was installed, which, as I said before, the installation was begun within a few days of the signing of this contract.

X Q. 79. You are not sure of the time when the apparatus was first used?

A. Couldn't give you the exact day, no, sir, quite busy at the time.

Mr. Hood: That is all.

Redirect examination by Mr. Jones:

R. D. Q. 80. You stated you couldn't give the exact date when the Bankes apparatus was actually put into use, was it a matter of days, weeks or months after the signing of the contract of June 8, 1907?

A. Not over a week.

R. D. Q. 81. Did you ever know Henry O. Webb or Faunt M. Woodward in connection with the building?

Mr. Hood: Objected to as not proper examination.

A. I remember Mr. Woodward who was the man in charge of the [fol. 368] work by the Roebling Construction Company. They did the metal lathing and furring throughout the building. I don't remember Webb distinctly.

R. D. Q. 82. Do you know whether or not there was such a man on that job?

A. I am not positive, to swear to it, no, sir.

R. D. Q. 83. During the erection of that building, about how high was the hopper above the floor being poured?

A. It varied from one to three stories, or rather from three to one floor.

R. D. Q. 83a. Who was the architect of the American Theater Building?

A. Mr. Bonsack; he is deceased.

R. D. Q. 84. Who is carrying on the work of his office?

A. His son.

R. D. Q. 85. Do you know his name?

A. Fred C. Bonsack.

R. D. Q. 86. Mr. F. C. Bonsack having arrived with the records from his office, will you look them over and state if you can identify them?

A. I have here a dozen tracings of the American Theater Building, one of them being dated, having the notation, "revised, May 10/07," and entitled that it is a hotel building for the Southern Real Estate and Financial Company and erected on the northeast corner of Seventh and Market Streets, F. C. Bonsack, architect—basement plan. This tracing also bears on it the signature identified with the contract between the Southern Real Estate and Financial Company and the Gilsonite Construction Company, contractor of the reinforced concrete work, June 8, 1907.

R. D. Q. 87. Whose handwriting is this date?

A. Joseph E. Norton and P. J. Clifford.

R. D. Q. 88. Who are the two latter parties?

A. Painters, contractors for the painting of this building.

[fol. 369] R. D. Q. 89. Does your handwriting appear elsewhere on this tracing?

A. Yes, I filled in the dates for several contracts.

R. D. Q. 90. When?

A. The date it was signed. The dates appearing therein, including the date of June 8, 1907, previously mentioned in my testimony. I have also a book labeled, "Contracts." Pages 76 and 77 are records of contracts for the erection of the American Theater and Hotel Building, Seventh and Market Streets. On page 77 is a record of the principal contract of the Gilsonite Construction Company, dated June 8, for $55,000, also two extras.

R. D. Q. 91. You don't know personally about these entries?

A. No, sir.

R. D. Q. 92. From your knowledge of the work, can you identify any of the contractors whose names appear on these two pages as having been connected with the work?

A. I believe all of them.

Recross-examination by Mr. Hood:

R. X Q. 93. Did you make any of the entries in this book on pages 76 and 77 to which you have referred?

A. No.

R. X Q. 94. Did you see them made?

A. No.

R. X Q. 95. Do you know who made them?

A. Made by the stenographer, Mr. Bonsack's office.

R. X Q. 96. You think they were made by the stenographer?

A. I know her handwriting sufficiently well.

Mr. Jones:

R. X Q. 97. When did you first see this book?

[fol. 370] A. As early as 1907, probably before. On page 115, are entries which were made by me.

Mr. Hood: Objected to as irrelevant and immaterial.

Mr. Hood:

R. X Q. 98. The entry of June 8, to which you referred to on page 77 of the book, about which you have testified, is not associated with any year date, is it?

A. Dated at the top of the page, 1907, which refers to the first entry of each one of these.

R. X Q. 99. There is at least one entry on this page dated Jan. 9, 1909, is there not?

A. Yes. At the bottom of the page there is an entry of January 9, 1909, for extra contracts for Powers and Boyd, sheet metal contractors.

A blue-print of this tracing is marked for identification, Defendant's Exhibit 33, Blue-Print of the American Theater Building.

Mr. Hood: Blue-print is objected to as wholly irrelevant and immaterial and an unnecessary incumbrance of the record.

Deposition closed.
Signature waived.

F. C. BONSACK, another witness called on behalf of the defendants, being first duly sworn, testified as follows:

Direct examination by Mr. Jones:

Q. 1. State your name, age, residence and occupation.
A. F. C. Bonsack; architect; 27 years of age; 609 Laclede Gas Light Building, St. Louis, Missouri.
Q. 2. Are you a son of F. C. Bonsack, deceased?
A. I am.
Q. 3. Who was the architect for the American Theater Building of St. Louis, Missouri?
A. My father, F. C. Bonsack.
[fol. 371] Q. 4. Were you associated with him at the time?
A. Not at that time, no.
Q. 5. Can you produce any records relating to this building?
A. I can. I have here a roll of the tracings from which the building was built and a contract book in which are entered the names of the contractors and the amounts of their contracts.

Mr. Hood: Objected to as incompetent.

Q. 6. Is blue-print, Exhibit 33, made from one of these tracings you have referred to?

Mr. Hood: Objected to as incompetent.

A. Yes.
Q. 7. Where did you find these records?

Mr. Hood: Objected to as incompetent.

A. I found them in the files of my father, which I now have. All records of work done in the last thirty-five years are in those files.
Q. 8. Have you been able to find any photographs showing the concrete distributing apparatus used on the American Theater Building?
A. We had some, but unable to find them, they were lost at the time, when I went into the Navy. I moved from the office, the office which father had, and moved out of there every old photograph and miscellaneous records which were not valuable to me. There were two large boxes and those boxes were sent to a warehouse which my uncle rented at that time on Biddle Street. While I was in the Navy he moved his warehouse to 921 Biddle Street, and broke those boxes, and a great many of those pictures and records were lost. I was unable to find in my records the pictures that were taken during the construction of the American Hotel and Theater.

Q. 9. Do you know Samuel C. Black, who just testified?
A. I do.
[fol. 372] Q. 10. Did you see the American Theater Building during the erection?
A. I did.
Q. 11. Explain the meaning of the record on pages 76 and 77 of the contract book you have produced and which Mr. Black referred to.

Mr. Hood: Objected to as incompetent.

A. This is a contract book kept as an office record, in which we enter the contracts on every job and pages 76 and 77 is the American Theater building, northeast corner of Seventh and Market Streets for the Southern Real Estate and Financial Company. We find on those two pages, the names of the contractors who did the work and the amounts of the contracts and the dates of the contracts.
Q. 12. According to the office practice, what did these dates indicate?

Mr. Hood: That is objected to as incompetent. This witness is testifying that he was not connected with the business of his father at the time of the inquiry, and so far as the record shows, it is wholly incompetent, he has no knowledge of the matter inquired about.

A. These are the dates the contracts were signed for the various parts of the work.
Q. 13. About how many sub-contractors appear on these pages?

Mr. Hood: Objected to as incompetent and not the best evidence.

A. Twelve or fourteen.
Q. 14. In whose handwriting were the entries made?
A. Couldn't say.
Q. 15. Are you willing to let that book out of your possession?
[fol. 373] A. I am not; it is an office record; can't let it go. I have got current jobs in here.
Q. 16. Did you ever visit your father's office during 1907?
A. Yes, I went there quite often.
Q. 17. What is your personal recollection of the year when the building was built, aside from the records?
A. Aside from the records, I used to go once in a while over to the building to watch the construction work, to see what was going on. I was in school at the time.
Q. 18. Any recollection of what year it was?
A. I know that the American Theater Building was started in that year, at that time, I know what other jobs I had, as far as that goes.

Cross-examination by Mr. Hood:

X Q. 19. You had nothing to do with the making of anything of the entries on pages 76 and 77 of the book, contract record book about which you testified?
A. No.

X Q. 20. You didn't see any of the entries made?
A. No.

Redirect examination by Mr. Jones:

R. D. Q. 21. Do you know where the plates are from which the photographs were made?
A. A commercial photographer by the name of Hampson, he took the pictures as the work progressed. The pictures that were taken during the erection of the building he has no record of. Probably considered them immaterial after the building was finished. Probably destroyed. He told me yesterday, he didn't have them anymore.

Mr. Hood: Statements of witness relating to what was sold by the commercial photographer is objected to as hearsay.

Signature waived.

[fol. 374] St. Louis, Mo., Feb. 12, 1921—10 a. m.

Present: Same as before.

HERMAN A. BANKES, another witness called on behalf of the defendants, being first duly sworn, testified as follows:

Direct examination by Mr. Jones:

Q. 1. Please state your name, age, residence and occupation.
A. Herman A. Bankes; 56, the 29th day of August, 1920; Breman Avenue; running a confectionery store, at the present time.
Q. 2. Were you subpœnaed to testify in this case?
A. Yes, sir.
Q. 3. Did you decline to respond to the first subpœna served on you several days ago by a notary public?
A. I considered it was no subpœna to make me come to court.
Q. 4. You were then subpœnaed again later by the U. S. Marshal?
A. Yes, sir.
Q. 5. This suit is based on the Callahan patent No. 948,719, relating to the distribution of concrete by means of tower and chutes. Have you ever testified before in a suit relating to this general subject-matter?
A. Yes, sir.
Q. 6. Can you tell us about when that was and who the parties were?
A. There was Insley, I believe that was his suit, I am not sure.
Q. 7. About how long ago?
A. Well, I should think four or five years ago, I couldn't tell exactly, neighborhood of that.
Q. 8. Are you the same Herman A. Bankes who was called as a [fol. 375] witness about the winter of 1914-15 in a suit pending in the Canadian court in which you testified as follows (reading):

"HERMAN A. BANKES, a witness produced on behalf of the defendants other than Mussens, Limited, having been first duly sworn on the Holy Evangelists, in accordance with his religion, by the said Commissioner, deposes and says, in answer to questions, as follows:

"(Objections omitted.)

"Q. I. What is your name, age, residence and occupation?

"A. Herman A. Bankes; age, 49 years last birthday; residence, No. 8200 Church Road, St. Louis, Missouri, U. S. A.; occupation, superintendent of re-enforced concrete work.

"Q. II. For what company do you work, Mr. Bankes?

"A. Now, at the present time, for the McCormick Coons Construction Company of St. Louis.

"Q. III. For whom did you work before then?

"A. Gilsonite Construction Company.

"Q. IV. Between what years did you work for the Gilsonite Construction Company?

"A. Between 1897 and 1908.

"Q. V. Do you know of a reservoir near St. Louis commonly called 'Baden Reservoir'?

"A. Yes, sir.

"Q. VI. Who built it?

"A. Gilsonite Construction Company.

"Q. VII. Did you have anything to do with the building of it?

"A. I superintended the construction of it.

"Q. VIII. Please state how you had the concrete placed during the building of this reservoir.

"A. Some of it was wheeled; some of it was carried to places in little cars, and some of it was carried and placed through chutes.

"Q. IX. How long were these chutes?

"A. The longest was two hundred and forty (240) feet.

"Q. X. About what year was this reservoir built?

"A. I think it was in 1905 and 1906.

[fol. 376] "Q. XI. Do you know of a building here in St. Louis called the Ely-Walker Warehouse?

"A. Yes, sir.

"Q. XII. Who built it?

"A. Gilsonite Construction Company done the concrete work; James Stewart was the general contractor.

"Q. XIII. What, if anything, did you have to do with its construction?

"A. I superintended the concrete work for the Gilsonite Construction Company.

"Q. XIV. How was the concrete placed in the construction of this building?

"A. With wheelbarrows.

"Q. XV. Explain in detail, how the concrete was gotten to the wheelbarrows.

"A. We had a system of bins built on the Sixth Street side; about six feet from the basement floor was the bottom of them. We drive

the team over the top of the bins, dump the material in the bins, and from the bins into little cars. I mean by little, twenty-two to twenty-five cubic feet. An endless chain would catch the axle of the car, take it up an incline to the top of the mixer, then dump the car in the mixer, dump from the mixer into a skip or bucket; 'skip' it is usually called; hoist the skip to the floor and dump it into a receiving hopper and from there into wheelbarrows.

"Q. XVI. In what sort of a structure was this skip hoisted?

"(Objection omitted.)

"A. In a tower, or what I usually call a tower, four pieces, one on each corner, stay lathed and sway braced.

"Q. XVII. During the construction of this Ely-Walker Building, did you remain satisfied with this method of placing the concrete?

"A. No, sir.

"Q. XVIII. What changes, if any, did you wish to make?

"A. I wished to use chutes when it was about half-way up, about the fourth floor, or along about there.

"Q. XIX. Please explain more in detail how you wished to use these chutes.

[fol. 377] "A. Well, in the first place, it took twenty-five (25) men to take the material away as fast as we could mix it, and we had only six men below putting it into the mixer, and we thought the chutes would do away with a lot of labor and cut down expenses. I drew up a plan to hang a boom and chutes on the tower, submitted it to the company, and they didn't want to spend the money on that job, as it was over half done. So I left it drop there.

"(Objections omitted.)

"Q. XX. How did you propose to get the concrete from the hopper at the top of the tower into the chute?

"(Objections omitted.)

"A. From the bottom of the hopper on top of the tower which the skip dumps into.

"Q. XXI. You have stated you wanted to mount a boom on the tower and support chutes from it——

"(Interruption by the witness.)

"A. So as to swing around.

"Q. XXII. When was this Ely-Walker building built?

"A. In 1907.

"Q. XXIII. Do you know a building here in St. Louis known as the American Theater and Hotel Building?

"A. Yes, sir.

"Q. XXIV. Who built it?

"A. Gilsonite Construction Company did the concrete work. The other work was let to different contractors. Hartman Brothers did the brick work, and other work was sub-let.

"Q. XXV. What, if anything did you have to do with it?

"A. I superintended the re-enforced concrete work.

"Q. XXVI. Please explain how the concrete was placed in the construction of this building.

"A. We had bins on the Market Street side, we drove wagons over and dumped them in the bins, out of the bins into little cars, an endless chain catched them by the axle, take them to the top of mixer and dumped it into mixer out of the mixer into a skip, and hoist the skip up and dump into receiving hopper, and out of receiv- [fol. 378] ing hopper pass through chutes to spouts; 'spouts' we called them because they were inclosed.

"Q. XXVII. In what sort of a structure did this skip travel?

"A. In a tower.

"Q. XVIII. On what was the hopper supported?

"A. On the tower.

"Q. XXIX. When was this American Theater and Hotel Building constructed?

"A. In 1907.

"Q. XXX. I now call your attention to two photographs, which have been marked 'A' and 'B'; to whom do these belong?

"A. They belong to me.

"(Objections omitted.)

"Q. XXXI. What do these two photographs show?

"A. They were taken principally to show the spouts distributing the concrete at the time.

"Q. XXXII. What spouts, and what concrete, and where?

"A. On the American Theater and Hotel Building job.

"(Objections omitted.)

"Q. XXXIII. Are you willing to part with these photographs?

"A. No, I am not.

"Q. XXXIV. Will you please state on the record why?

"A. Because I have about one hundred and fifty (150) photographs and I keep them from every job and I sometime will have a little den of my own and I might want to hang them on the wall to show what I have done in my younger days, when I am smoking good cigars.

"(Objections omitted.)

"Q. XXXIV. Do you know of a building here in St. Louis called the 'Coliseum'?

"A. Yes, sir.

"Q. XXXV. Please state, if you can, when this was built?

"A. In 1908, I am pretty sure.

"(Objections omitted.)

"Cross-examination declined.

"Deposition closed."

[fol. 379] A. Yes.

Q. 9. Are the facts, as stated in this prior deposition, correct to the best of your knowledge and belief?

A. Yes, sir.

Q. 10. Have you the Photographs A and B referred to in this prior deposition?

A. Yes, sir.

Q. 11. Will you please produce them?

(Witness produces photographs.)

These photographs are marked for identification Defendants' Exhibit 2.

It is stipulated that photographic reproductions may be used in place of the originals, and that Exhibit 2 constitutes a correct reproduction of said photographs.

Q. 12. Do you wish to keep these photographs?

A. Yes, sir.

Q. 13. Are these photographs marked in pencil, A and B, in the upper left-hand corners, the identical two you produced during the Canadian depositions?

A. Yes, same two, yes, sir.

Q. 14. Where have they been since that time?

A. In my possession.

Q. 15. You state in your prior deposition you were forty-nine years old, at that time, that would have been about six years ago?

A. Must have been along about that length of time, I couldn't tell exactly, long about that time.

Q. 16. Was this Canadian suit the one you previously referred to in which you testified as a witness on behalf of Insley?

A. In that deposition, yes, sir, that was for Insley.

Q. 17. Please refer to the photograph constituting the upper half of sheet 2 of Exhibit 2 and state where that picture was taken.

[fol. 380] A. Baden Reservoir, St. Louis, Missouri.

Q. 18. Do you appear in the picture?

A. Yes, sir, right here.

Q. 19. Where did you get the lower photograph on that sheet showing a tower and dome in the background?

A. Was sent to me from St. Joseph, Missouri.

Q. 20. About when—do you remember?

A. Well, it was about the year after we were on the American Theater.

Q. 21. Where has that photograph been in the meantime?

A. In my possession.

Mr. Hood: The photograph just referred to, if offered in evidence, is objected to on the ground that it has not been properly identified.

Q. 22. You remember who sent it to you?

A. A fellow by the name of Bill Bess.

Mr. Hood: Further objected to, photograph is further objected to on the ground that the present evidence relating thereto is not the best evidence.

Q. 23. Where was Bess at the time?

A. St. Joseph, Missouri.

Q. 24. Are you the same Herman A. Bankes who refused to sign an affidavit at my request last summer in connection with the preliminary injunction motion in this suit?

A. Yes, sir.

Q. 25. But you produced the four photographs at that time which you have just produced today?

A. Yes, sir.

Q. 26. Did you ever know S. C. Black, J. W. Goebel, F. M. Woodward or H. O. Webb?

A. I know Mr. Goebel; can't place Black.

Q. 27. Did you know any of these parties in connection with the American Theater Building?

[fol. 381] A. Was he the superintendent?

Q. 28. I am asking if you knew any of these parties in connection with the Ely-Walker Building or American Theater Building?

A. I knew of Black, that was connected with the American Theater Building, who was superintendent for the architect, I couldn't tell you his initial, I remember his name was Black.

Q. 29. In Photograph A of the American Theater Building, Exhibit 2, the tower appears to be braced by two diagonal braces?

A. Yes, I guess it was.

Q. 30. What part of the building were those braces used on?

A. Top floor, on the roof.

Q. 31. Used also on the lower floor?

A. No, sir.

Q. 32. On the lower floor, on what was the hopper supported?

A. I-beams, planks laid across, with braces laid across and the hopper hung from it.

Q. 33. What was the relation of the hopper to the tower on these lower floors?

A. To dump concrete into.

Q. 34. Was it fastened to the tower in any way?

A. Not on the lower floors, no, sir.

Q. 35. Where was it fastened to the tower?

A. I don't understand your question. Take a two by eight and nail it to the tower and let it stick out about six feet, then put an angle brace down to support the outer end. Then laid the tower between these two planks,—the hopper between these two planks on the roof only.

Q. 36. You testified for Insley in the Canadian suit that the hopper was supported on the tower?

[fol. 382] A. That is just what I said now.

Mr. Hood: Objected to unless the exact words referred to by counsel be read to the witness.

Q. 37. The question I referred to was 27: "In what sort of structure did this skip travel? A. In a tower. Q. (28). On what was the hopper supported? A. On the tower." Was that statement true also with reference to the floors below the roof?

A. No, sir, different, constructed different.

Q. 37a. Would you kindly explain a little more in detail how the hopper was supported on these lower floors with reference to the tower?

A. Lay a brace on one bay crosswise and let the hopper drop down in those, between those planks which would hold it.

Q. 38. Was the hopper fastened to the tower in any way?

A. No, sir.

Q. 39. But it was alongside of the tower?

A. Yes, sir.

Q. 40. Was the tower outside of the building or inside of the building?

A. Inside of the building.

Q. 41. In some kind of a shaft or opening?

A. Yes, sir.

Q. 42. How were the—explain a little more in detail how the chutes were, how the pipes were supported?

A. Hung to these I-beams, from one I-beam to the other.

Q. 43. And what proportion of the floor area could you reach with them?

A. Any part of the building.

Q. 44. How did you manage to reach first one side and then the other side of the building?

A. I had a swivel joint, turn either way, and then by spouts, [fol. 383] run a main line from one end of the building, then distribute from there around.

Q. 45. On the Baden Reservoir, explain a little more fully how the chutes were supported.

A. On trestles.

Q. 46, Were those always in the same place or could they be moved?

A. Just put there for one place, not used any more.

Q. 47. I mean, could the point of delivery of the concrete be changed or was it always in the same place?

A. No, move the last length.

Q. 48. You moved all the chutes?

A. Only the short chute—sixteen feet.

Q. 49. What was that last length?

A. Used a sixteen-foot chute and swung it around.

Q. 50. So that the last length, you could always swing around?

A. One length all the time, we moved that to distribute the concrete, two feet thick, twenty-two feet wide, the concrete was.

Q. 51. You have stated in your previous deposition that "I drew up a plan to hang a boom and chutes on the tower"; did you ever show that plan to anyone?

A. Yes, sir.

Q. 52. You remember who?

A. Showed it to Walter Goebel.

Q. 53. You remember on what kind of paper that sketch was made?

A. Drafting paper, pencil sketch.

Q. 54. How was the boom shown in that sketch in relation to the tower?

A. It comes from the top of it, above the hopper, so that it hung to the top of the tower, cable, block on down there down to the chute, one length of chute.

Q. 55. You mean to indicate by that gesture an inclined boom?

[fol. 384] Mr. Hood: Object to that as leading.

A. Inclined boom.

Q. 56. Did you say that boom projected out from the tower?

A. On an angle, on a rise.

(Witness indicates with his hand upwardly inclined boom.)

Q. 57. You say then, the top of the boom was secured near the top of the tower in some way?

A. Yes, sir.

Q. 58. By what?

A. By block and tackle, supposed to be.

Q. 59. What was the purpose of that boom?

A. To hold that chute up, was going to run the concrete through.

Q. 60. In what direction was the boom movable?

A. Sideways, either way.

Q. 61, Mr. S. C. Black, who previously testified, referred to some arrangement of bins and cars on the American Theatre Building; can you describe this arrangement a little more fully?

A. Just the same as on the Ely-Walker Building, same apparatus was taken from the Ely-Walker.

Q. 62. Did you get up this arrangement?

A. Yes, sir.

Q. 63. Where is the Baden Reservoir?

A. Baden Reservoir?

Q. 64. Yes.

A. 8300 North Broadway, St. Louis, Missouri.

Q. 65. Near the river?

A. No, sir.

Q. 66. Near the Merchant's Bridge?

A. No, sir.

Q. 67. How far back from the river is it about?

A. I couldn't tell you that,—mile anyhow.

[fol. 385] Q. 68. I call your attention to Defendants' Exhibit 3 and ask if you can identify the structure shown therein?

A. You want me to describe it?

Q. 69. I just want to know if you can identify this structure.

A. Well, it looks like it might be the Coliseum of St. Louis.

Q. 70. Did you see the Coliseum as it was being erected?

A. Just once.

Q. 71. About how much of the concrete work on the American Theater Building was built by the use of your pipe distributing apparatus?

A. All of it.

Q. 72. Do you recall who the attorney was representing Insley at the time of this Canadian deposition?

A. No, sir.

Q. 73. Was it Mr. Schley?

A. Couldn't tell you.

Q. 74. In addition to Goebel, did you tell anyone that you were the inventor of this scheme proposed for the Ely-Walker Building?

A. I showed it to the carpenter—carpenter foreman that was on the job.

Q. 75. Did you tell anyone on the American Theater Building that you were the inventor of the spouting system used there?

A. Why, not particularly, that I know of.

Q. 76. You mean you may have told someone, but don't recall whether you did or not?

Mr. Hood: Objected to as entirely an assumption.

A. No.

Q. 77. Why didn't you apply for a patent on this apparatus?

[fol. 386] A. Well, I didn't have the money to start with. At the time I didn't think it could be patented. Hard time getting money to put the chutes up.

Q. 78. As a matter of fact, did the device operate successfully as far as the concrete was concerned?

A. Yes, sir.

Q. 79. In all other respects?

A. Yes, sir.

Q. 80. As I understand your previous answer, in the sketch you made of the Ely-Walker Building, you showed the tower with a boom having its lower end swinging on the tower in some way and extending upwardly at an angle, with its upper end fastened by a block and tackle secured to the tower, and a chute hung from the boom; is that correct?

Mr. Hood: The question is objected to as grossly leading and putting words into the mouth of the witness. It is also objected to as wholly immaterial. The testimony speaks for itself.

A. Yes, sir.

Q. 81. Have you still the sketch that you showed Mr. Goebel?

A. No, sir.

Cross-examination by Mr. Hood:

X Q. 82. The swivel joint to which you have referred in your testimony relative to the apparatus which was used on the American Theater Building is the swivel joint that is supported by a square frame work at about the middle of the photograph "B" of Defendants' Exhibit 2, is it not?

A. Yes, sir, that is it.

X Q. 83. The attention of the witness is particularly called to the square frame work at approximately the exact middle of the photo-

[fol 387] graph "B." That swivel joint was supported by the square

frame work which in turn was supported on the steel frame of the structure; is that right?

A. On the roof only.

X Q. 84. Then you didn't use the swivel joint on the lower floors?

A. Yes, sir.

X Q. 85. How was the swivel joint supported on the lower floors—by a trestle?

A. Laid planks across the I-beams, and let this other hopper dump into that, around from underneath *this* planks. (Witness makes a swinging motion.) These planks laid across the I-beams.

X-Q. 86. At the time you were working on the Ely-Walker Building, what salary did you get?

A. $150 a month, I am not sure, I think it was.

X Q. 87. When was that?

A. Well, I couldn't tell the exact date.

X Q. 88. What year was it?

A. I think it was in 1907, I couldn't tell you for sure, the only way I could make sure, to look at the date on the photograph, on the Ely-Walker photographs, which was dated by the man that took the photographs.

X Q. 89. What was your salary while you were at work on the American Theater and Hotel Building?

A. Same salary, wasn't changed.

X Q. 90. You have a pretty accurate recollection of what the exact structure of the apparatus was which you used on the American Theater Building foundation?

A. Yes, sir.

X Q. 91. You think you would be more likely to remember the precise details than anybody else, in view of the fact that you built it?

A. I think I would, yes, sir. I worked hard enough on it, ought to remember.

[fol. 388] X Q. 92. You didn't put up the chutes which you used on the American Theater Building at your own expense, did you?

A. No, sir.

X Q. 93. Did you ever see the actual apparatus which is illustrated in the lower photograph of sheet 2 of Defendants' Exhibit 2?

A. No, sir. You mean on the job?

X Q. 94. Yes.

A. No, sir.

X Q. 95. Then you don't know anything about this photograph except that it was sent to you by the man you named?

A. No, sir.

Deposition closed.

Signature waived.

The Notary: Mr. Bankes asking leave to make a further statement, the following statement was made:

Mr. Bankes: I felt I was entitled to a little money for my photographs, as I kept them all these years, and when Mr. Jones last

summer said that he couldn't very well give me very much, he would give me twenty-five dollars, I told him that I wouldn't consider it in any shape or form, and for him and the notary public to get out of my house.

JAMES L. HOPKINS, another witness called on behalf of the defendants, being first duly sworn, deposes and testifies as follows:

Direct examination by Mr. Jones:

Q. 1. State your name, residence, and occupation.

A. James Love Hopkins; residence, St. Louis, Missouri; occupation, attorney-at-law; lawful age.

Q. 2. I call your attention to patent No. 948,746, issued February [fol. 389] 8, 1910, to Arthur L. Smith, and Concrete Appliance Company on an application filed February 23, 1909, and ask if you know the attorneys for said patentee, Hopkins and Eicks, whose names appear thereon.

A. I was the senior member of that firm, composed of myself and Alfred A. Eicks, February 8, 1910.

Q. 3. You recall an interference, No. 30,533, which arose during the prosecution of that application?

A. I couldn't recall the number of that, I know that this application was in interference, a three-party interference.

Q. 4. I call your attention certified copy of a Patent Office record entitled interference No. 30,533, Callahan v. Emtman v. Smith, and will ask you if you are the James L. Hopkins who made the affidavit appearing therein?

Mr. Hood: Objected to as irrelevant and immaterial.

A. That is my signature; apparently this is a copy of an affidavit which I made in the interference you refer to.

Q. 5. Just give the date of the affidavit.

A. The affidavit being dated August 30, 1909.

Q. 6. I call your attention to what purports to be a copy of the preliminary statement of Arthur L. Smith, executed July 28, 1909, and will ask if you know who prepared that preliminary statement?

Mr. Hood: Objected to as irrelevant and immaterial.

A. I prepared the preliminary statement of Arthur L. Smith in that interference. As to whether this is a true copy of that preliminary statement, I couldn't say. At this time as far as I know, I think this is a correct copy, I couldn't identify it, to be exact.

[fol. 390] This preliminary statement and the certified copy previously referred to are marked for identification Defendants' Exhibit 36, Copies of Preliminary Statements.

Mr. Hood: The defendant is notified that any offer of this exhibit in evidence will be objected to as irrelevant and immaterial, and not properly pleaded.

Q. 8. Will you kindly state your recollection of the circumstances attending the declaration and prosecution of this interference?

Mr. Hood: The question is objected to as irrelevant and immaterial. Further object to the examination of this witness relative to the subject-matter inquired about, on the ground that it is a privileged communication so far as the party Smith is concerned and there is no showing of any waiver of that privilege so far as Smith is concerned. It is clearly improper to examine this witness at this time under the record as it now stands, purely and solely on the ground of privilege, the witness having testified that he was an attorney for Smith in the matter inquired about.

A. Prior to the issuance of this Smith patent referred to I was one of the parties interested in the organization of the Concrete Appliance Company of Missouri and was a stockholder therein and was attorney for that corporation in its organization. The privilege matter can be based upon that as well as the witness's relation with Arthur L. Smith. It is only proper to state that in the record.

Mr. Hood: In view of the statement just placed on record, examination of the witness relative to the subject-matter inquired about [fol. 391] is further objected to on the ground that it is a privileged communication so far as one of the plaintiffs in this case is concerned, and that the record doesn't show that there has been any waiver *or* that privilege.

Q. 9. Read the question, please.

(Witness handed paper. Question read.)

Mr. Hood: I object to witness being handed uncertified copies of papers.

A. I have only a general recollection of the circumstances. The matter of the declaration of the interference is a matter of record. I don't recall that any action was taken. The interference was disposed of by settlement between the parties in which I represented Mr. Smith and the other two parties were represented by the then firm of Townsend, Lyon and Hackley, and Mr. Sheehy of Washington. Does that cover your question?

Q. 10. The records show that this interference was terminated by concession of priority from Emtman and Callahan to Smith. Do you recall whether this concession was made with or without a consideration of the probable evidence to be introduced?

Mr. Hood: Objected to. The question is not justified by the record as it now stands. It is understood and agreed that the objections previously entered to this line of examination may stand without repetition.

A. The concession of priority was entered into after a conference between counsel for the respective parties.

Mr. Hood: Objected to as wholly irrelevant and immaterial and incompetent. The conclusions which may have been reached by the witness or other parties can have no possible bearing in this case which must be decided by the court on the evidence showing facts upon which proper conclusions may be raised. Certain conclusions [fol. 392] of this witness cannot be binding in the present case.

Q. 11. Were you subpœnaed to testify as a witness in this case?
A. Yes, sir, by you.
Q. 12. Prior to the conference with the other attorneys you have just referred to, did you make any investigation of the prior activities of Arthur L. Smith with respect to his alleged invention?
A. I visited Norfolk, Virginia, at his request and under his instructions, for that purpose.
Q. 13. What did you do in Norfolk?
A. I interviewed a number of witnesses in relation to the structures referred to in his preliminary statement.
Q. 14. Did this investigation of yours, in any way, confirm the facts previously set out in the Smith preliminary statement?

Mr. Hood: Objected to as irrelevant, immaterial and incompetent, and calling for a statement of conclusion.

A. So long a time has elapsed, I have only a general impression that my investigations were with the result of corroborating his preliminary statement.
Q. 15. In your conferences with the attorneys for Emtman and Callahan, do you recall whether you informed them regarding the result of your investigation in Norfolk?

Mr. Hood: Objected to as irrelevant and immaterial.

A. We had the usual discussion of facts. I do not doubt that I referred to my visit to Norfolk but I could not recall positively that I mentioned my visit. Of course, the localities were given in our preliminary statement and the facts could be developed by them as readily as by myself.
[fol. 393] Q. 16. Do you recall the names of any of the parties you may have interviewed at Norfolk?
A. I do not.
Q. 17. Do you recall interviewing a number of parties?
A. There were several.
Q. 18. Was your inquiry directed to the buildings referred to in the Smith preliminary statement, the Lynnhaven Hotel and the Vinery Building?
A. They were directed to two buildings and those seem to be the names. I recall that the architect of one of those buildings was not available as his office was in Richmond, Virginia, and that I saw somebody in the offices of the architect of the other building who was in Norfolk, a Norfolk architect with his office there.

Q. 19. Do you recall ever having any conference at Washington with Arthur L. Smith about this period?

A. I recall having had at least two conferences with him in Washington. He had an office in a building which I think was called the Blackstone Building. The dates of those conferences I couldn't fix now. It might have been either before or after my visit to Norfolk.

Q. 20. The preliminary statement mentioned the St. Louis Coliseum. Have you any personal knowledge of the relation of the Smith patent to the erection of that building?

A. I recall distinctly that before he came to me with his application for a patent, there was nothing left of his structure in the Coliseum. The work had been completed and the draftsman got his data from material which Mr. Smith gave him.

Q. 21. You understood then, did you, that there was some connection between the Coliseum job and Mr. Smith's application at that time?

Mr. Hood: Objected to as incompetent. The understanding of [fol. 394] this witness of the matter inquired about has nothing to do with the issues in this case.

A. I knew nothing about it except what Mr. Smith told me.

Q. 22. Did he mention the Coliseum in that connection?

A. Yes, sir.

Mr. Hood: Objected to as hearsay.

A. He said that he used an apparatus at the Coliseum, of which he produced the original data as the basis for his application for patent.

Mr. Hood: Counsel for plaintiff moves to strike the entire deposition from the record for the reasons set forth in the various objections of the record.

Signature waived.

St. Louis, Missouri,
Saturday, Feb. 12, 1921—2:30 p. m.

Present: Same as before.

JOHN WALTER GOEBEL, another witness called on behalf of the defendants, being first duly sworn, testified as follows:

Q. 1. Please state your name, age, resdence and occupation.

A. John W. Goebel; 47 years of age; 3527-A Connecticut Street, St. Louis; contractor; president of the J. W. Goebel Contracting Company, 4242 Clayton Avenue, St. Louis.

Q. 2. Have you ever testified in a suit involving distribution of concrete through chutes in a tower?

A. Yes, sir.

Q. 3. About how long ago was that?

A. Five or six years ago.

[fol. 395] Q. 4. Is that suit the one which is identified as Concrete Appliance Company v. Rourke, 3287, 1913, a copy of a desposition in which case I call to your attention?

Mr. Hood: The question is objected to as incompetent on the ground that the copy shown the witness is not the original.

A. Yes.

Mr. Jones: Mr. Hood is asked to produce the original deposition and that of Herman A. Bankes at the hearing.

Q. 5. Does this copy which I have shown you correspond, as far as you can recollect, with your testimony at that time?

Mr. Hood: Objected to as incompetent and immaterial.

A. Yes.

Mr. Jones: This copy is submitted to Mr. Hood for his inspection.

Q. 6. Mr. Jones: Do you know Herman A. Bankes?

A. Yes, sir.

Q. 7. How recently have you seen him?

A. I think it has been six or seven years.

Q. 8. Have you been told of or read any testimony which he may have given in this present case in the last few days?

A. No.

Q. 9. In your work do you employ chutes for distributing concrete?

A. Yes.

Q. 10. When did you first see such chutes used?

A. On the American Theater Building, corner of Seventh and Market Strets, St. Louis.

Q. 11. Please describe in more detail that apparatus.

A. It was an outfit consisting of mixing machine in the basement, [fol. 396] a tower, and skip or bucket by means of which the concrete was hoisted to the top of this tower and dumped into a hopper and from this hopper conveyed into the position by means of chutes which were suspended from a wire cable or hung by derrick or swung to I-beams as the case may be. In this particular case the chutes were suspended from the I-beams of the building since this type of building was what we term a steel skeleton structure.

Q. 12. Who got up this apparatus?

A. The apparatus at the American Theater Building was gotten up by Mr. Bankes, who was then foreman for the Gilsonite Construction Company, by whom I was at that time employed.

Q. 13. State whether you know of a structure near St. Louis known as the Baden Reservoir.

A. Yes, that was constructed by the Gilsonite Construction Company, in 1903, I think.

Q. 14. Did this structure involve any concrete?

A. It was built entirely of concrete.

Q. 15. How was the concrete deposited?

A. A good deal of it was deposited by means of wheelbarrows, concrete being dumped from a mixing machine directly into the wheelbarrow and then wheeled into position and a good deal of it was deposited by means of wooden chutes.

Q. 16. How were the chutes supported and what was their relation to the mixer?

A. The basin was in the ground, the mixing machine was on the bank alongside of it. These chutes run from the mixing machine to the wall or bottom as the case may be, and were supported by wooden trestles; sometimes the chutes rested on a part of the finished wall.

Q. 17. Did the trestles always remain in the same position?

[fol. 397] A. Not necessarily; they were moved from time to time.

Q. 18. Did the chutes always deposit concrete in the same place?

A. They mere moved as the work required.

Q. 19. Explain a little more fully how they were moved.

A. Well, just two or three men picked them up and carried them in position and then placed them on the trestles.

Q. 20. That is both the trestles and the chutes were moved to meet conditions; is that correct?

A. That is correct.

Q. 21. Do you recall about how far the chute ran from the mixer?

A. No, that would vary, sometimes the mixing machine would be close to the wall and sometimes would be fifteen or twenty feet away.

Q. 22. What was the relation of the individual chutes with relation to each other?

A. I don't understand the question, "their relation to each other."

Q. 23. You have stated that the chutes ran from the mixing machine to the bottom of the reservoir; I want to know how these chutes were connected to provide a continuous run?

A. I am not familiar with the details of that particular job to answer that question.

Q. 24. What was the relation of each chute to its neighbor? I mean by that, were they adjacent or remote or connected in any way?

A. Sometimes the ends of those chutes were flared or, in other words, made larger on one end, so that one chute would fit inside of the other; sometimes one chute was just resting on the top of the other.

[fol. 398] Q. 25. Did you have any connection with the building of the Ely-Walker Warehouse of St. Louis?

A. I was assistant manager for the Gilsonite Construction Company, who had the contract for the reinforced concrete work on the warehouse building for the Ely-Walker Dry Goods Company built on the corner of Seventeenth and Locust Streets.

Q. 26. What was the difference between the chuting arrangement on the Baden Reservoir and that on the American Theatre Building?

A. The chuting arrangement on the American Theater Building,

the chutes were made of sheet iron, whereas, on the Baden Reservoir, my recollection is they were simply wood chutes.

Q. 27. Was there any other difference in the manner of transferring the concrete from the mixer to its final destination?

A. Yes, the concrete had to be hoisted at the American Theatre Building.

Q. 28. Please read your answer to Q. 9 and 10 and state if you intended to exclude the Baden Reservoir in that answer.

A. No, sir. I answered it that way because I had in mind building construction, whereas the Baden Reservoir was simply a hole in the ground.

Q. 29. How was the concrete distributed on the Ely-Walker Building?

A. Wheelbarrows.

Q. 30. How did it get from the mixer to the wheelbarrows?

A. The concrete was mixed in the basement by a machine and dumped from this machine into a skip or hopper and then elevated to the floor on which it was being used and then dumped from this skip or bucket into a hopper and then from this hopper loaded into [fol. 399] wheelbarrows or we may have used two wheel wagons at the time, I can't recall that, and then conveyed into position.

Q. 31. Was there anything unusual about this apparatus?

A. No.

Q. 32. You mean that the similar apparatus had been used before?

A. Yes.

Q. 33. Who was the general superintendent on this work?

A. Mr. Victor Hugo Clark, and under him his assistant was H. A. Bankes.

Q. 34. Was there any discussion about placing the concrete in a different manner on this building?

A. Yes.

Q. 35. Explain what you refer to?

A. During the construction of the Ely-Walker Building, Bankes came into the office one day with a sketch showing a method by which he proposed to spout or chute the concrete into position instead of wheeling it. He proposed to do this by means of chutes suspended from a derrick which could be swung from side to side and raised or lowered as may be required.

Mr. Hood: The answer is objected to as relating to a matter not properly pleaded.

Mr. Jones:

Q. 36. Did you see the sketch?

A. Yes, Bankes showed it to me. It was made on a piece of yellow sketching paper.

Q. 37. Was it in ink or pencil?

A. Pencil is my recollection.

Mr. Hood: This entire line of examination is objected to as relating to matter not properly pleaded and it is agreed that this ob-

[fol. 400] jection may be considered as entered without repetition to all questions and answers relating to this subject-matter.

Mr. Jones:

Q. 38. Please make a sketch reproducing as well as you can recall it, the Bankes sketch?

(Witness makes sketch.)

Q. 39. You have stated in answer to Q. 35 that the derrick would be swung from side to side and raised or lowered. Please indicate on this sketch the arrangement by which this could be accomplished.

(Witness amplifies sketch by an explanatory note.)

Q. 40. On what was this derrick supported?
A. On the tower.
Q. 41. What kind of connection was proposed between the upper end of the chute and the hopper?
A. The details of that I don't recall; didn't know anything about it, just a general idea.
Q. 42. What was the general idea with reference to the connection betwen the chute and the hopper?
A. By general idea, I mean the general idea about the entire scheme, about the details of that connection I don't know.
Q. 43. You have stated that the derrick could be moved from side to side and that it supported the chutes; what became of the chutes during such swinging?
A. Swung with the derrick.
Q. 44. Was this apparatus of Bankes put in use on the Ely-Walker Building?
A. No.
Q. 45. Why not?
A. If I recall it, because the building was pretty well along and we didn't want to make any changes.

The sketch is marked for identification Defendants' Exhibit 37, Goebel Sketch.

[fol. 401] Mr. Hood: The sketch is objected to as relating to matters not properly pleaded.

Q. 46 What is your recollection as to the time when the concrete work was done on the Ely-Walker building?
A. Commenced in the spring of 1907 and finished about July.
Q. 47. I call your attention to a book entitled Some Stewart Structures, and will ask if you can identify the buildings referred to on pages 41 to 45 inclusive?

Mr. Hood is advised that this is the book produced during the Chicago depositions and which he requested to have available in St. Louis.

Mr. Hood: This book is objected to on the ground that it shows on its face that it was published subsequent to the date of applica-

tion upon which the patent at issue was issued; it has not been properly proven nor pleaded.

A. Yes, on pages 44 and 45 there are photographs of the warehouse building that the Gilsonite Construction Co. constructed—the reinforced concrete part of the structure.

Q. 48. Have you any independent recollection of the date of this work aside from the dates appearing on the several photographs, i. e., Februarv 15/07, April 1/07, May 1/07, June 3/07, July 1/07, Aug. 1/07?

A. Yes, as I stated before, the work commenced in the spring of 1907 and finished about July.

Q. 49. According to your recollection, about when was the concrete work begun on the American Theatre Building?

A. That was started just about the time that the reinforced concrete work on Ely-Walker Building was completed, it would be about July, 1907.

Q. 50. I call your attention to Defendant's Exhibit 33, and will [fol. 402] ask if you can identify the structure shown in this blueprint.

Mr. Hood: Objected to as relating to an exhibit not properly proven and as irrelevant and immaterial and relating to a matter not properly pleaded.

A. From my recollection, it is the basement plan of the American Theatre Hotel Building, I don't know what you mean by identification.

Q. 51. I simply meant, do you recognize the building from the outline of it and the details shown?

A. Yes.

Q. 52. What is the meaning of the various names and dates written on different parts of this blue-print?

Mr. Hood: Objected to as incompetent. There is no showing that this witness was connected in any wav with the architect's office or that he has any knowledge on the subject inquired about and to enable him to interpret.

A. It is usual with architects in making contracts to have the contractor sign the tracing and also in some cases each page of the specification.

Q. 53 What was the practice of the Gilsonite Construction Company in this respect?

A. We were generally called upon to do the same.

Q. 54. About when were the foundations for this building put in?

A. I don't know except that they were put in prior to the time that we commenced to put the floors in which would be prior to July, 1907.

Q. 55. Assuming that the date on this tracing May 10/07, indicates the date when the drawings were made would it have been possible to put in the foundations in advance of this drawing?

Mr. Hood: Objected to as assuming matters which have not been [fol. 403] proven and as calling for an incompetent conclusion.

A. Yes, because there may have been a foundation plan. This is the basement plan.

Q. 56. Referring to the prior practice of elevating concrete in the tower and distributing it from a hopper and wheelbarrows or carts, which you say was done in 1907 on the Ely-Walker Building, what was the location of the hopper on the tower in such cases as the building became higher?

Mr. Hood: Objected to as assuming. The witness has not testified that in the apparatus referred to the hopper was on the tower.

A. I don't quite understand it. The hopper was moved from floor to floor or raised on the tower.

Q. 57. On what was the hopper supported in such cases?

A. On the tower.

Q. 58. About how high was the tower on the Ely-Walker Building at its maximum?

A. The tower was built to begin with—the tower was started in the basement and built high enough above the first floor to allow the hopper to be installed so that a wheelbarrow or a cart, as the case may be, could get underneath it to allow the concrete to be dumped ino it; to be dumped into the wheelbarrow or cart.

Q. 59. What was done after the first floor was finished?

A. The tower and hopper was raised consecutively and so on throughout the building.

Q. 60. On this particular building, how high was the tower when it reached its utmost height?

A. It must have been the height of the building plus whatever height was necessary to get above the roof to allow the hopper to be installed.

[fol. 404] Q. 61. About how many stories did this building have when finished?

A. About eight floors, if I remember correctly.

Q. 62. On the American Theatre Building, where was the hopper as the work progressed?

A. That was generally two or three floors or four floors above the floor when the concrete was being deposited.

Q. 63. I call your attention to Defendants' Exhibit 2, and will ask you if you recognize the structure in the first sheet of photographs A and B.

A. That looks like the tower to the concrete spouting apparatus, but there is nothing on there that I can identify it.

Q. 64. Did you have occasion to visit the roof of the American Theatre Building during erection?

A. Probabilities are that I was up there.

Q. 65. Do you know anything about the apparatus of the lower photograph of the second sheet of this Exhibit 2?

A. Tootle-Campbell Building, St. Joseph, Missouri, I think I have seen it before.

Q. 66. You recognize the building in the photographs Defendants' Exhibit 14?

A. That is the Tootle-Campbell, St. Joseph.

Q. 67. What concrete spouting apparatus are you referring to in answer to Q. 63?

A. None in particular, just a concrete spouting apparatus. It is possible that that might be on the roof of the American Theatre Building.

Mr. Hood: The conjecture of the witness is objected to as purely speculative.

Q. 68. Do you intend the court to imply from your previous answers to Q. 63 and Q. 67 that the photographs A and B look like the [fol. 405] tower and concrete spouting apparatus of the American Theatre Building, but that you are unable to identify them positively?

Mr. Hood: The question is objected to as grossly leading in view of the repeated testimony of this witness when photographs A and B were shown to him that these photographs show a concrete tower and chuting apparatus, but that he had no particular apparatus in mind in answering the question and that there was nothing in the photograph by which he could identify it. Counsel for plaintiff protests against the practice of counsel for defendant by putting words in the witness' mouth.

Mr. Jones: The witness' answer to Q. 63 was that "That looks like the tower."

A. Yes.

Q. 69. You previously testified, did you not, that you saw the tower and chutes used during the erection of this building?

A. Yes.

Q. 70. About how often did you visit the building?

A. Once a day.

Q. 71. Was there any comment or discussion by yourself or others regarding this apparatus?

A. Quite a number of people visited the building, while we were using these spouts for concrete, the builders, architects, material men and others interested in building industries.

Q. 72. And did you have any discussion with these men regarding the apparatus?

A. I think I can recall one case.

Q. 73. What was the discussion about?

Mr. Hood: Objected to as irrelevant, immaterial and incompetent.

[fol. 406] A. About it being an economical method of placing concrete, something that we thought was brand new that never had been used before.

Q. 74. Have you used apparatus of this general character since that day, 1907?

A. Yes.

Q. 75. To what extent in a general way?
A. We use it on all concrete structures.
Q. 76. How soon did you begin using it after 1907?
A. Used it on the Tootle-Campbell Building in 1908.
Q. 77. Did you personally see that building being built?
A. I visited the building about once a month.
Q. 78. During this period from 1907 to the present day, what are the various arrangements you have employed for supporting chutes in your work where a tower is involved?
A. Principally by cables that are fastened to the top of the tower, then swung down so as to reach the floor, the chutes are then suspended from this cable, by means of block and tackle. That is the only way that I have ever done it. Of course, in steel structures chutes are suspended from the steel beams in the building.
Q. 79. You mean you have never used chutes supported on top of the trestle?
A. Yes, we have used chutes supported on trestles.
Q. 80. Have you ever supported any part of the chutes to a boom?
A. No.
Q. 81. Why not?
A. Just never had the occasion to use it.
Q. 82. What occasion calls for a boom?
A. In a place where you couldn't very well anchor your cable to support the chutes.
Q. 83. In your sketch Exhibit 37, is there any other name that might be applied to the swinging derrick?
[fol. 407] A. Swivel derrick, you might call it.
Q. 84. What is the difference between a derrick and a boom, such as you have just been talking about?
A. Well, a derrick consists of what you would call a mast and a boom. The mast in this case would be the tower.
Q. 85. Referring to your sketch Exhibit 37, did Bankes propose any scheme to control the flow of concrete from the hopper to the chutes?

Mr. Hood: Objected to as leading in view of the previous testimony of the witness.

A. In every case where a hopper was used there was always a man stationed at the hopper to open and close the gate at its lower end which of course regulates the flow of the concrete.
Q. 86. How many contractors were employed on the American Theater Building, one or more?
A. There might have been a dozen.
Q. 87. Was the Tootle-Campbell Building a steel-frame building?
A. No, sir, it was a reinforced concrete structure.
Q. 88. Was a boom used on the American Theater Building?
A. No, not to my knowledge.
Q. 89. Why did not Bankes use a boom, after proposing the apparatus shown in your Exhibit 37 sketch?
A. It wasn't necessary on the American Theater Building.

Q. 90. Why not?
A. Because we had the steel beams to support these chutes with.
Q. 91. How much of the area of each floor on the American Theater Building could be reached by these chutes?
A. All of it.
[fol. 408] Q. 92. How was this possible?
A. The chutes were moved from time to time.
Q. 93. Did you see the St. Louis Coliseum being built?
A. Passed by there several times.
Q. 94. Do you recall the concrete apparatus used?
A. They had a tower and a mixing machine and spouting.
Q. 95. Was this before or after the American Theater Building?
A. After the American Theater Building.

Disect examination closed.

Cross-examination by Mr. Hood:

X Q. 96. How many times did you see the sketch which you say Mr. Bankes made and showed to you during the progress of work on the Ely-Walker Building?
A. I saw it when he brought it in, he left it lay on my desk, laid there for quite a length of time, I guess it was referred to perhaps once or twice. I remember very distinctly he came in one day and asked for it.
X Q. 97. How long has it been since you saw that sketch the last time?
A. That would be 1907.
X Q. 98. And as I understand your testimony, you are not sure of the details of the construction shown by this sketch, but merely recall the general scheme, is that right?
A. Yes, that is right.
X Q. 99. When you testified in the case of Concrete Appliances Company against Rourke, some of the questions asked you and the answers which you gave were as follows:

"Q. 19. In this scheme which Mr. Bankes wished to try on the Ely-Walker job, and of which he made a sketch, how was the boom of which you spoke, to be supported?
[fol. 409] "A. I don't know anything about that. I did not go into details with him of how he intended to support the boom at all.
"Q. 20. Do you know on what he intended to support it?
"A. The boom was to be supported on top of the tower as I said before, and was to be swiveled so that it could be moved from one side of the building to the other. The tower was to be guyed."

Is it your recollection that the portions which I have quoted were a part of your deposition in that case ?
A. Yes
X Q. 100. And the answers which I have quoted were true at that time and are true at the present time?
A. Yes.

X Q. 101. You were shown a certain blue-print marked Exhibit 33, if that blue-print had had no title upon it, such for instance the title "Theatre and Hotel Building for the Southern Real Estate and Financial Company, etc.," do you think you would have been able to state what particular building was illustrated?

A. Not at this time, no.

X Q. 102. Except for the title, you would not have been able to tell that this particular blue-print related to the American Theatre and Hotel Building job?

A. No.

X Q. 103. I understand you to say, or perhaps one of your answers might be construed to say, that on the American Theatre Building job, the chutes were sometimes suspended from a wire cable, extending from the tower, and sometimes hung by a derrick. Now, as a matter of fact, there was no time during the American Theater job that the chutes were supported or hung either from a wire cable or from the derrick?

A. I didn't say that, but I did say that they were suspended from the I-beams perhaps by a wire cable.

X Q. 104. Then it is a fact, is it not, that on the American Theatre [fol. 410] job, the chutes were never suspended from a derrick or boom carried by the tower, and were never suspended from a cable which itself was attached to a high point on the tower and was anchored to some suitable anchor?

A. Yes, it is a fact.

X Q. 105. You never saw any apparatus for chuting concrete comprising a tower and hoisting mechanism and a hopper associated with a tower and a chute arranged to receive the concrete from the hopper until you saw the apparatus which was put into use at the American Theatre Building, is that right?

A. I never saw an apparatus of that character until that time.

X Q. 106. How long prior to 1907 had you lived in the city of St. Louis?

A. Thirty years.

X Q. 107. During the year 1906, did you have occasion to be in the neighborhood of Union and Cabanne Streets at any time?

A. I can't recall it.

Mr. Jones: Objected to as improper cross-examination.

X Q. 108. Do you recall the public school building at Union and Cabanne Streets?

A. I am not positive about it.

X Q. 109. Do you know a public school here in St. Louis commonly called the Clark School?

Mr. Jones: Same objection.

A. I think I have heard of it.

Q. 110. But are you not familiar with that school or its location?

A. No.

X Q. 111. I call your attention to Q. 63 of your present deposition,

[fol. 411] and ask you if it is not a fact that your answer as transcribed by the Reporter is incorrectly transcribed and should have been as follows: That looks like a tower to a concrete spout apparatus, but there is nothing on there that I can identify?

A. Yes.

X Q 112. Are you willing to say that the sketch which you have produced and which has been marked Defendants' Exhibit 37 is in all particulars like the sketch which you say Bankes showed to you in 1907?

A. I cannot say that it is in all particulars exactly the scheme that Bankes proposed.

X Q. 113. Now, isn't it quite possible, Mr. Goebel, your recollection of that Bankes sketch may have been modified or changed by structures which you have seen in recent times?

A. There is a possibility of that, but every time that I saw the evolution of the concrete mixture as we used it in the beginning and today, I always thought of the scheme that Bankes proposed, in that it seemed to bear out his idea.

X Q. 114. And you considered the apparatus at the American Theater Building to be a practical carrying out of the idea which you say Bankes had disclosed to you in 1907?

A. Yes.

Q. 115. That is all.

Redirect examination:

R. D. Q. 116. Please read your answers to Qs. 19 and 20 in the Canadian case, which Mr. Hood read to you and explain what you meant therein when you stated that the boom was to be supported on top of the tower.

A. The top of the boom—the top of any boom is always supported [fol. 412] by means of a cable from the boom to the mast, which in this case the mast would be the tower. And it was to swivel at the bottom so that it could be moved from either side, moved to either side.

R. D. Q. 117. You have not answered the question which was related to the supporting of the boom "on top of the tower."

A. I answered that the boom was to be supported on top of the tower by means of a cable extending from the end of the boom to the top of the tower.

R. D. Q. 118. You did not mean then that the entire boom was resting on the highest point of the tower, but that the upper end of the boom was connected with the top of the tower; is that it?

Mr. Hood: Objected to as leading.

A. I did not mean that the boom itself rested on the top of the tower, simply that the upper end of the boom was fastened to the top of the tower.

R. D. Q. 119. Mr. Hood has called your attention to the fact that in this Canadian testimony, in referring to the boom apparently,

you stated, "I don't know anything about that," and today you make a sketch of apparatus showing the relation of the boom to the rest of the outfit. Where did you get this information which enables you to make this sketch?

A. What I meant to convey was that I did not know anything about the details of this construction, but simply knew and remembered the general scheme.

R. D. Q. 120. In any conference or correspondence which I or anyone else may have had with you regarding this suit, has any suggestion been given to you as to the manner in which this boom might have been located on the tower or is this sketch Exhibit 37 made from your own recollection?

A. Never was anything suggested to me by anybody regarding this sketch number 37.

[fol. 413] R. D. Q. 121. How do you fix the date of 1903 for the work on the Baden Reservoir?

Mr. Hood: Objected to as not properly redirect.

A. I remember that that was prior to the year of our World's Fair here in St. Louis.

R. D. Q. 122. Did you inspect the apparatus at the St. Louis Coliseum carefully or casually during its erection?

Mr. Hood: Objected to as not proper redirect.

A. Just casually from the street as I drove by.

R. D. Q. 123. Did you ever know parties named Black, Webb or Woodward, in connection with the American Theater Building?

Mr. Hood: Objected to as not proper redirect.

A. Webb or Woodward I can't recall, but remember Mr. Black as being the superintendent for the architect Mr. F. C. Bonsack.

R. D. Q. 124. In your answer to Q. 113, explain more fully what you mean by the "concrete mixture."

A. I really meant to say, the evolution of the system of handling concrete in structural reinforced buildings—concrete buildings.

R. D. Q. 125. By structural you mean steel framework or reinforcing rods or both?

A. When you say structural reinforced concrete you of course, eliminate steel structures, in other words, steel I-beams and columns.

R. D. Q. 126. Was there any arrangement on the American Theater Building chutes by which the angle of one chute could be changed relatively to the next chute section?

Mr. Hood: Objected to as not proper redirect and as leading.

A. Yes, he would lead those chutes from the tower a certain dis-[fol. 414] tance and then they would empty into a kind of a hopper that led into another chute which could be turned in any direction.

Recross-examination by Mr. Hood:

R. X Q. 127. The "sort of a hopper" which you have mentioned in your answer to question R. D. Q. 126 was supported upon a framework which is separate from the tower and was itself supported on planks laid from one beam to another of the steel framework of the building, was it not?

Mr. Jones: Objected to as not based on the testimony of the witness, as to these details.

A. As I said before these chutes were run from the tower to a certain place in the building and then entered into a hopper, this hopper might have been supported on a plank or on the I-beam.

R. X Q. 128. But that "sort of a hopper" which was associated with the spout which could be turned around was not itself carried by the tower in which the hoisting skip was located, was it?

A. The hopper referred to is a part of the chuting system. That had no connection with the tower, except that the ends of the chute that led to this hopper was connected to the hopper at the top of the tower.

R. X Q. 129. And the lower end of the chute which led from the tower to this "sort of a hopper" was itself supported on the framework which carried the "sort of a hopper," that is right, isn't it?

A. It may have been supported by that support or it may have been supported by one of the cables suspended from one of the I-beams above.

Deposition closed.
Signature waived.

[fol. 415] It is stipulated that if D. G. Scott were called as a witness to testify on behalf of defendants, he would testify that he is the manager of the St. Louis office of James Stewart & Company, Incorporated, with offices in Boatmen's Bank Building, St. Louis, and that semi-monthly progress photographs taken during the construction of the Ely-Walker Dry Goods Company Warehouse, St. Louis, show that on March 15, 1907, fifty per cent of the first floor forms were in place; April 1/07, thirty per cent of the second floor forms were in place and fifty per cent of the first floor concrete was poured; April 16/07, thirty per cent of the second floor slabs were poured; June 3/07, the entire sixth floor was concreted and by July 1/07, the eighth story reinforced concrete frame was complete.

It is stipulated that if Eugene Taylor were called as a witness, he would testify that during 1908 he had the contract from the Gray Construction Company to take a picture each week of the St. Louis Coliseum construction on Jefferson and Washington Avenues, St. Louis; that the said Coliseum to his knowledge was erected during July, August, September and October, 1908; that he took the original photographs from which the five cuts constituting part of Defendant's Exhibit 3 are reproductions, said photographs having been taken July 22, 1908, September 22, 1908, September 8, 1908, Octo-

ber 19, 1908, and October 27, 1908, the dates appearing on or under these respective photographs except that the picture stamped by the photographer September 8, 1908, has incorrectly printed under it the date of September 22, 1908, and the September 22, 1908 picture is incorrectly printed September 8, 1908. It is further stipulated that these half-tone reproductions may be used with the same force and effect as prints made at the respective dates from the original negatives.

[fol. 416] It is further stipulated that said Eugene Taylor would testify that he took the photograph "Defendants' Exhibit 22," August 27, 1908, at the request of Arthur L. Smith, and at his direction put on the negative, shortly after it was developed, the wording and the date appearing thereon; and that the print Exhibit 22 is a correct reproduction of said negative. It is agreed that the print may be used in lieu of a print made on the date given above.

By Mr. Jones: The testimony of W. L. Wimmer, whose name was given in the notice preceding the St. Louis depositions, was not taken, for the reason that the said Wimmer did not return from Florida as he had planned, and was therefore not available.

St. Louis, Mo., Feb. 12, 1921.

WILBUR B. JONES, another witness called on behalf of defendants, being first duly sworn, testifies as follows:

Q. 1. Please state your name, age, residence and occupation.

A. Wilbur B. Jones; attorney-at-law; 32; 4944 Lindell Blvd., St. Louis, Missouri.

Q. 2. Have you made any effort, at my request, to locate the original plates of the Tootle-Campbell Building, St. Joseph, Missouri, from which prints of Defendants' Exhibit 14 were made?

A. Yes; I wrote J. E. Pollock, commercial photographer, St. Joseph, Missouri, September 1st, 1920, asking if he had these plates and receiving no reply, wrote another letter September 9th, 1920, the second letter being returned without having been delivered. After writing my second letter of September 9th, 1920, to Mr. Pollock, I received from Mr. Pollock an answer to my first letter of [fol. 417] September 1st, which stated that he was now residing in Paola, Kansas, and was no longer in the photography business, and that he had no access to said plates but that his successor was E. F. Cook, 923 Jule Street, St. Joseph, Missouri. I received a letter from said Mr. Cook September 18th, 1920, stating that he did not have the original negatives of these plates in his files.

Mr. Hood: Counsel for plaintiff moves to strike the entire deposition as irrelevant and immaterial.

Signature waived.

Adjourned to meet in Chicago, Feb. 15th, 1921.

Chicago, February 15, 1921.

Parties met pursuant to agreement. Present: As before.

LEWIS A. STINSON, a witness produced, sworn, and examined in behalf of defendants, deposes and testifies as follows in answer to questions by Mr. Jones:

Q. 1. Please state your name, age, residence and occupation.

A. Lewis A. Stinson; fifty-six years; 171 N. Elmwood Ave., Oak Park, Illinois. I am a contracting engineer.

Q. 2. Have you had any experience in the erection of grain elevators?

A. Yes, twenty-five years' experience.

Q. 3. Were you connected in any way with the erection of an elevator in New Orleans for the Illinois Central Railway?

By Mr. Hood: Objected to as relating to matter not properly pleaded, and it is agreed that this objection may be considered as entered without repetition to all questions and answers relating to this particular subject-matter.

[fol. 418] A. I was engineer on the job.

Q. 4. Are you familiar with anything shown on blueprints G-1184 and F-825, constituting part of Defendants' Exhibit 29?

A. They were made under my instructions.

Q. 5. Explain a little more in detail what your connection was with this work and with these drawings.

A. These spouts were required to load a ship, what is known as "second-off," meaning one ship moored by the side of another would be tied direct to the dock. This necessitated a very long reach, and in order to support said spout the boom and fixtures shown on the drawing were worked out to meet that requirement.

Q. 6. What did you have to do with the drawings?

A. They were made under my direction in the office of the job, as well as all other general drawings in connection with elevator D and gallery system, for both D and E.

Q. 7. Did you personally have any part in making these drawings?

A. I personally made the sketches for the special appliances, and worked more or less on tracings.

Q. 8. Does your handwriting appear on either of these drawings?

A. My printing appears on the tracings from which these drawings were made.

Q. 9. Who was the Webster Manufacturing Company, whose name appears on these drawings?

A. They were the manufacturers of all machinery and equipment which was used on these jobs.

Q. 10. Did they manufacture the equipment for this particular job?

A. They manufactured all equipment for handling grain of every kind in the entire job, excepting engines, boilers and electrical apparatus.

[fol. 419] Q. 11. Did you personally see this equipment during its erection?

A. I supervised the erection of it. I was in daily contact with them.

Q. 12. Please describe briefly this New Orleans apparatus.

A. Said apparatus consists of a spout with an enlarged receiving end, inside of which is a wrought iron ring pivoted to same. At 90° from said pivot on circumference of ring are two ears, which were pivoted to the building supports. A boom, supported by pivot step at its lower end and placed directly under the common center of the upper support, standing at an angle of about 45°, is used for raising and lowering the outer end of said spout, allowing same to swing in an arc on a horizontal plane of about 180°. The base of the boom and the peak are fixed, and the raising and lowering of the spout is accomplished through a wire rope tackle, hitched at point of boom and spout. The line from said tackle follows the angle of the boom to a pulley block, which is yoked on pivot supporting the base of the boom and swinging with same, from which said line is led to the operating winch at a convenient height above dock level. The spout is provided with a telescopic end for reaching the various distances horizontally, which may be required, due to the various positions of ship.

Q. 13. Please refer to the detail drawings F-825, and state by number which is the wrought-iron ring pivoted to the spout.

A. No. 2, also No. 4—both pivoted. The answer does not exactly express a true condition, as No. 2 might be called a part of the spout. Is that all right?

Q. 14. Please refer to print G-1184 and mark with red pencil the means for supporting the ring from the building support that you have referred to.

[fol. 420] A. Witness writes "support" in connection with the lead line leading to the lower right-hand corner of the figure in the center of the sheet.

Q. 15. Can you point out the parts on print F-825 which are supported by this support?

A. No. 5.

Q. 16. Do you know anything about the apparatus shown in the remaining blue-prints in this Exhibit 29, i. e., G-581, G-575, G-1198, G-1651?

A. No.

Q. 17. Have you ever seen similar apparatus?

A. Yes.

Q. 18. About how early?

By Mr. Hood: Objected to as relating to matter not properly pleaded.

A. My memory is about 1904, this G-581.

Q. 19. This blue-print is labeled East Side Iron Elevator Co.; have you ever seen that particular apparatus?

A. I have seen that particular spout, yes.

Q. 20. About when?

A. I made frequent trips there, and I just can't associate the earliest date, but I saw that particular spout.

Q. 21. I am not sure whether you said you had seen the apparatus of the remaining three blue-prints?

A. No, I had seen the apparatus, but I am not familiar with it.

Q. 22. You mean you have seen similar apparatus, but not these identical structures?

A. Yes.

Q. 23. And your answer giving the date "1904" was intended to apply to these three prints?

By Mr. Hood: The question is objected to as leading and as not in accord with the previous testimony which, in referring to the year 1904, specifically referred to print G-581.

[fol. 421] A. No, I am not sure on date of these three spouts, but they are very familiar—very common.

Q. 24. Would you say they were common as early as 1907?

By Mr. Hood: Objected to as leading.

A. I could not say.

Q. 25. Can you produce any other drawings representing grain spouting apparatus which you personally were connected with?

A. John F. Metcalf Company's tracings WA-945 and 946.

By Mr. Hood: The answer is objected to as referring to matter not properly pleaded.

Witness produces two tracings, which are marked for identification "Defendants' Exhibit 38, Blue-Prints of Portland, Me., Elevator."

It is stipulated that blue-prints may be used instead of the original tracings.

Q. 26. Describe this apparatus briefly.

A. This apparatus consists of a spout with an enlarged end hinged to a turn-head, which revolves with the spout one-half circle of 180°, a boom pivoted on vertical center of said turn-head and fixed at upper end by a wire cable at an angle of about 45°. From the point of said boom a tackle is suspended, which works with a similar tackle permanently hitched to the spout. The raising and lowering is accomplished by wire cable and winch attached to the building structure.

By Mr. Hood: The answer is objected to as relating to matter not properly pleaded, and it is agreed that this objection may be considered as entered without repetition to all questions and answers relating to this subject-matter.

Q. 27. What was your connection with this work?

[fol. 422] A. General superintendent. I was also a partner in the John S. Metcalf Company.

Q. 28. Did you see this apparatus during erection and use afterwards?

A. Yes, sir.

Q. 29. Was this apparatus and the New Orleans apparatus successful or unsuccessful in operation?

A. Perfectly satisfactory in every respect.

Q. 30. About how long have these two equipments been in use?

By Mr. Hood: Objected to as immaterial, no showing being made that the witness has had any continuous knowledge of either apparatus.

A. The Portland, Me., equipment about twenty years; the New Orleans equipment fifteen years.

Q. 31. Have you seen either of them since they first went into use?

A. I have seen the New Orleans frequently, and Portland twice.

Q. 32. What is the purpose of the boom in these two equipments?

A. Its function is to raise and lower the spout, to reach the hatches of the ship under various conditions of load or tide; also to house the boom when swung clear of ship.

Q. 33. Explain what you mean by "house the boom."

A. When the ship leaves the dock the spout must be swung clear of the ship and held in position in a manner that will not interfere with navigation.

Q. 34. Explain the connection between the upper end of the spout and the part which extends into it, as shown in dotted lines, which permits this swinging movement you have referred to.

A. The dotted lines permit of vertical movement. The turn-head permits of the horizontal or swinging movement. (Witness [fol. 423] pointed to the flange about half an inch above the end of the spout.)

Q. 35. Explain the construction of this turn-head.

A. A cast-iron base is bolted to the building at the upper side; the lower side has a circular flange. The curved spout has a similar flange. The two flanges are held in place by a split collar, grooved to receive said flanges and fitting loosely.

Q. 36. Do the dimensions shown on these drawings represent approximately the size of the various parts as actually used?

A. The drawing is made to scale, with the exception of mechanical discrepancies of the same.

Q. 37. Please point to the part which permits the vertical movement you spoke of.

A. The outer end of the curved spout is changed from round to square; the upper end of the steel spout is also square, and connection is made by a rod on the upper side, forming a pivot. (Witness points to the upper corner of the long inclined spout.)

Q. 38. The rod is not shown in the drawing, is it?

A. Not on general drawings.

Q. 39. Was this hinged and swivelled connection a new thing at the time this Portland elevator was built about 1901?

By Mr. Hood: The question is objected to as assuming a fact which has not been testified to by this witness, or any other witness.

A. No. It was used in 1900 in Newport News, Va., and about 1896 at Southport, La.

Q. 40. Aside from the Portland and New Orleans elevators, have you ever seen any other elevators prior to 1907 in which the spout was supported by a horizontally swinging inclined boom, as distinguished from a horizontally swinging horizontal boom?

[fol. 424] A. Newport News, in 1900, and Southport, La., in 1896.

By Mr. Hood: Objected to as relating to a matter not properly pleaded.

Q. 41. Prior to 1907, did you ever see a swivel connection such as sketched in red pencil in section on print G-575?

A. That was used in Newport News and Portland—that section.

Q. 42. Have you had any experience in concrete work?

A. Yes, twenty years of it.

Q. 43. Is there any reason why the spouts which you erected in New Orleans and Portland could not be used for concrete as well as grain?

A. I know of no reason provided the angle was sufficient and the concrete was mixed at the usual consistency.

Q. 44. What is the usual consistency at the present time?

A. About 12 per cent water, or so that material will flow.

Q. 45. What is the practice today as compared with the practice when you built the Portland elevator, for example, with reference to the amount of water used in concrete?

A. It is made much wetter today than it was then. The mixture on that particular job would stand at an angle of about 40° on the mixing board.

Q. 46. Do you mean that a pile of it would assume that slope?

A. That was the angle of natural repose.

Q. 47. What is the angle of repose of modern wetter concrete?

A. It flows quite freely. If placed on a flat board most of the mortar will run out of the stone.

[fol. 425] Q. 48. Do contractors in their work encounter the same problems on the various jobs they handle?

A. Rarely ever the same conditions.

Q. 49. Have you seen the chutes used at the present time for distributing concrete from towers?

A. Yes.

Q. 50. What are the different ways of supporting them?

A. I have seen cables used, trestles, a boom, or supported from the boom derrick on the job, if there was one, and from a number of tackle leading from a pilot wire.

Q. 51. You have described booms for supporting chutes on grain elevators. What other arrangements have been effected for supporting grain chutes or pipes prior to 1907?

A. A counterbalance spout, the trolley spout, and the mast spout.

Q. 52. Have you ever seen grain spouts supported on a frame or trestle?

A. Yes, the Missouri Pacific elevator in Kansas City; also an

elevator in Buffalo—I can't just name the elevator now, but it's down about the canal.

Q. 53. What was the standard practice about 1905-06 in elevating the concrete from the mixer to the plane of the different floors of a concrete building under erection?

By Mr. Hood: Objected to as incompetent.

A. A bucket or skip was used in a tower, which automatically dumped at the desired level into a receptacle from which the trucks or wheelbarrows were filled.

Q. 54. Are you familiar with the apparatus shown opposite page 42 of "Defendants' Exhibit 21, Ransome Catalogue"?

A. Yes, I have seen it used.

Q. 55. About how early?

[fol. 426] A. I won't be sure about this particular device. I saw similar used about 1905.

Q. 56. I hand you copies of a number of patents set up in the answer in this suit, and will ask you to glance at the drawings and read the name and number of any disclosing apparatus that you may be familiar with.

A. Edwards & Kelly, 366,468; McLennan, 371,343; Robinson, 524,984; Bird, 582,598; Bellinger, 605,375; Robinson, 622,019.

Q. 57. If you are familiar with the Mayo grain spout, please describe it.

A. The Mayo spout is made in two sections, pivoted about its center, or at a point which will accommodate it to its various requirements. The upper end is supported from a turn-head bolted to the building; the bottom end is carried on casters or rollers. A support is placed near the center pivot and hitched to a trolley, which rolls on a circular track supported to the building, allowing the spout to make a complete circle.

Q. 58. Are you familiar with any of the apparatus illustrated in the marked pages of Defendants' Exhibit 12, Webster Manufacturing Co.'s catalogue?

A. Page 168, page 193, page 197, page 201, page 235 and page 241. I am familiar with all of that material.

Q. 59. Have you ever seen any of the grain elevators illustrated in Defendants' Exhibit 28, George M. Moulton & Company's book?

A. I have seen the West Shore elevator, page 25.

Q. 60. Referring to the apparatus you describe as the "standard practice" about 1905-06; what was the location of the "receptacle" with respect to the height of the building?

By Mr. Hood: Objected to as incompetent.

A. Some used a skip with a door in the bottom; others dumped. It was very common to make the hoisting skip on the job. It was [fol. 427] shifted to meet the requirements of the material—placed from floor to floor; sometimes one on every floor.

Q. 61. Prior to this time referred to, had you ever seen a boom, the lower end of which could be shifted vertically?

A. Yes, I had, for hoisting steel—reinforcing steel.

Q. 62. Do you use concrete chutes at the present time in your own work?

A. Very seldom, if ever; and then very short ones.

Q. 63. How do you place the concrete?

A. Two-wheel carts and wheelbarrows.

Q. 64. A prior witness, Anderson, suggested in his testimony that the double ring arrangement of print G-1184, the New Orleans job, in some way restricted the movement of the spout in its side swing and prevented it moving in an arc which is practically horizontal. Can you explain this difficulty?

A. I didn't know it existed. It has limitations when raised very flat—very high—due to the fact that the metal of the spout comes in contact with the supports.

Q. 65. In actual practice, how far could this spout be swung to one side, assuming that it remained in substantially the inclined position shown in this blue-print?

A. In actual practice I never saw it foul or engage.

Q. 66. Please answer the previous question.

A. About a half circle, if I understand your question right, the swing of a half circle.

Q. 67. Have you ever seen concrete spouts supported from a tower in the neighborhood of the steel mills which border the lake between Chicago and Gary?

By Mr. Hood: Objected to as irrelevant and immaterial and as relating to matter not properly pleaded.

[fol. 428] A. I saw some short spouts used while the various steel mills were being built in that location.

Q. 68. Are any of these illustrated in Defendants' Exhibit 19 catalogue?

By Mr. Hood: Objected to as incompetent and as relating to an exhibit which was published subsequent to the date of application upon which the patent in suit was issued.

A. I saw the apparatus used on the ore docks, Cincinnati, Hamilton & Dayton Railroad, Toledo (pp. 26-29).

Q. 69. Have you ever seen the apparatus of page 2?

By Mr. Hood The previous objection is repeated.

A. This looks very familiar.

Q. 70. Did you ever see the apparatus of photograph C of Defendants' Exhibit 17?.

By Mr. Hood: Objected to as relating to subject-matter not properly pleaded, and also to an apparatus which, according to the previous testimony of other witnesses, was not produced until after the date of the application upon which the patent in suit was issued, and therefore irrelevant and immaterial.

A. Yes, they controlled the spout by two booms—nothing unusual about the spout—a plain spout.

Q. 71. When and where did you see this?

A. In South Chicago, as I remember, ten years ago, maybe a little more. I won't be sure about the date.

Q. 72. What were the circumstances attending your visit?

A. I was doing work in South Chicago about the time and was very much interested, and made a visit over that plant and to Gary, at which time we were shown through the various furnaces and shown their various apparatus and construction.

Q. 73. How far along was the Gary plant at that time?

[fol. 429] A. A certain part of the Gary plant was running or some part of it was running, but the place was yet under construction. The side walks were not built, and quite difficult to get around—we had to follow railroad tracks.

Q. 74. Who was with you on that visit?

A. Mr. Jones was with me, who was in charge of the Iroquois furnace work. The Mill Company entertained the Board of Internal Combustion Engineers—I think that was who they were.

Recess for luncheon.

Q. 75. Who was the draftsman who made the drawings of these New Orleans tracings, G-1184 and F-825?

A. I expect Fred Church. F. C. are the initials on them.

By Mr. Hood: Objected to as incompetent and immaterial.

Q. 76. Is this the same party F. A. C. whose initials appear on print G-1651?

A. I would say so, because of the similarity of the lines. The initals are the same.

Q. 77. Where is Fred Church?

A. He is in California.

Q. 78. Aside from the initials, have you any recollection of any work he did on these tracings?

A. None whatever.

Q. 79. Then how do you recognize his name from the initials?

A. His initials are F. A. C., and I borrowed him from the Webster Manufacturing Company to take to New Orleans, and these initials "F. A. C." looks as if it were the same man.

Q. 80. What was he doing in New Orleans?

A. He was working for me on drawings for the Illinois Central work in New Orleans.

[fol. 430] Q. 81. What drawings was he working on?

A. On Illinois Central work.

Q. 82. What kind of work?

A. Grain elevator, dock spout, building construction generally and machinery.

Q. 83. Did the dock spout have anything to do with the dock spout in this blue-print we have been talking about?

A. I don't know anything whatever about them (G-1651, G-581 and G-1198 of Exhibit 29). This print was made there, G. 1184.

Q. 84. What I wish to know is, were you including G-1184 in your answer to Q. 78?

A. Those were the ones I meant (G-581, 1651 and 1198).

Q. 85. Are you familiar with the apparatus of Defendants' Exhibit 30?

A. No, sir, that is new to me.

Q. 86. You mean that you have never seen this coal-handling plant of the Baltimore & Ohio Railroad?

A. I did not erect it or put it up. I have seen the equipment.

Direct examination closed.

Cross-examination by Mr. Hood:

X Q. 87. When you were describing the apparatus shown in print G-1184, which forms part of Defendants' Exhibit 29, you said that the pivotal axis upon which the lower end of the boom was supported is directly under the common center of the rings by which the upper end of the chute is supported, did you not?

A. I said so in connection with the other drawings.

X Q. 88. I find that Q. 12 asked you to describe the New Orleans apparatus. The apparatus shown in G-1184 is the New Orleans apparatus, is it not?

A. Yes.

[fol. 431] X Q. 89. And in your answer to Q. 12 you stated that there was "A boom, supported by pivot step at its lower end and placed directly under the common center of the upper support, * * * " did you not?

A. I did, I meant the upper support for the guy line which supports the upper end of the boom.

X Q. 90. In this apparatus which we are now discussing the verticle axis of the boom was about 2 feet in advance of the intersection of the axes of the two rings by which the upper end of the chute was supported, was it not?

A. It is shown here that way (witness refers to the drawings) but was lessened about 6 inches in construction.

X Q 91. I understood you to say in your direct examination that one of the rings, which have been previously marked "2" and "4" in print F-825, was pivoted to the upper flared end of the chute section; did I understand you correctly?

A. I can't say whether you did or not. I don't know.

X Q. 92. You mean that you don't know whether I understood correctly?

A. Sure.

X Q. 93. Well, did you say that one of those rings was pivoted to the uper end of the chute section?

A. I did say that.

X Q. 94. To what was the other ring connected?

A. Which ring do you refer to now? Ring No. 2 is pivoted to No. 4; 4 likewise is pivoted to 2. No. 4 is pivoted to hanging bars marked 5; the hanging bars are bolted to outlets of gallery.

X Q. 95. Now which ring was pivoted to the chute, which is marked 1?

A. 4.

X Q. 96. And to what is No. 4 pivoted?

[fol. 432] A. Pivoted to 2.

X Q. 97. Was ring No. 2 connected in any way to anything else besides being pivoted to No. 4?

A. Riveted to the spout.

X Q. 98. So that ring No. 2 was riveted to the upper end of the spout, and was so placed that the axis of the perforations of the ears 3 were parallel with the face of the tower structure, and thus provided a horizontal axis for the chute, so that the outer end of the chute could be moved up and down; is that right?

A. Yes, sir.

X Q. 99. And the ring 2 was pivoted inside the ring 4, is that right?

A. No, sir.

X Q. 100. Was it outside the ring 4?

A. Ring 2 is outside of ring 4.

X Q. 101. And ring 4 was pivoted on the ears 5, which were stationary; is that right?

A. That's right.

X Q. 102. Now, which axis of ring 4, the long one or the short one, was pivoted to the ears 5?

A. The narrow way was pivoted to ears 5.

X Q. 103. And that formed an axis, a pivotal axis, for ring 4 on the stationary support and at right angles to the tower structure; that is, in a plane parallel with the plane in which the spout could be swung up and down; that is right, isn't it?

A. Yes, these ears gave the up and down movement.

X Q. 104. Do you mean that the up and down movement of the outer end of the spout was due to the fact that there was the capability of swinging about the axis formed by the ears 5?

A. The up and down movement was in ears 5 and the narrow way of the ring.

X Q. 105 Well, then, if the up and down movement of the outer [fol. 433] end of the spout was accomplished by reason of the swing about an axis furnished by the stationary ears 5, how could the chute have a sidewise movement?

A. Through these ears swinging—by the ears on ring 2.

X Q. 106. The ears 5 were stationary, weren't they?

A. Yes, sir.

X Q. 107. Was the line extending from the perforation of one ear 5 to the perforation of the other ear 5 parallel with the face of the tower, or at right angles to it?

A. Parallel with the face of the gallery.

X Q. 108. And the long axis of ring 4 was pivoted on the ears 5 and was parallel with the face of the gallery?

A. The short axis of ring 4 was pivoted on ears 5 and parallel with the face of the gallery.

X Q. 109. And the fixed inclined spout that is shown in dotted

lines at the upper part of print G-1184 projected down into ring 4; is that right?

A. Yes, sir.

X Q. 110. So that ring 4 had a limited swing on an axis parallel with the face of the gallery or tower, this axis being a fixed axis furnished by the ears 5; is that right?

A. Yes, sir.

X Q. 111. And this is the axis that permitted an up and down swing of the outer end of the chute; is that right?

A. Yes, sir.

X Q. 112. And the ring 2 was pivotally connected to ring 4 on the long axis of ring 4, and the ring 2 was outside of the long diameter of ring 4; is that right?

A. Yes, sir.

X Q. 113. And this is the axis about which all sidewise swing or sidewise movement of the outer end of the chute must and did take place?

[fol. 434] A. Yes, sir.

X Q. 114. I suppose that when the chute was in its middle position, so far as any sidewise movement is concerned, ring 4 was horizontal, wasn't it?

By Mr. Jones: Instead of this detailed discussion of unassembled parts, it is suggested that the witness be asked to make a sketch showing the assembled rings, in order to clear up this matter.

A. Nearly so.

X Q. 115. Now, isn't it a fact that any sidewise swing of the chute in this apparatus would inevitably result in a raising of the chute?

A. If hanging like a pendulum, yes.

X Q. 116. If in the position illustrated in the print G-1184, the same thing is true, is it not?

A. Not to the same extent—to some slight extent, and the nearer level it got it would all disappear.

X Q. 117. Could the chute in the apparatus shown in print G-1184 ever be brought to a level position?

A. While not made for that position, I believe it can be brought to a level.

X Q. 118. How would you get it up past the end of the boom?

A. The gimbel, as I understand it, is the point under discussion.

X Q. 119. You appear to have misunderstood my preceding questions: Now let us get back to the spout or chute and assume that it is in the position shown in print G-1184; you have that in mind now, have you?

A. Yes.

X Q. 120. Now let us suppose that you wanted to swing the lower end of that chute to one side or the other from its middle position; what would you do to get that shift of position?

A. I would pull the spout around.

[fol. 435] X Q. 121. And that would make it swing, at its upper end, about an axis furnished by the long axis of ring 4, and that axis would be at right angles to the gallery or tower, and would be parallel with the plane of the chute; that is right, isn't it?

A. Yes, sir, as I understand it.

X Q. 122. You mean by that you understand that is the operation?

A. As I understand your question that is the answer.

X Q. 123. Is there anything about my question that is not perfectly clear to you?

A. Not a thing.

X Q. 124. And when you pull the lower end of the spout to one side or the other from its middle position, that lower end will always rise; will it not?

A. No.

X Q. 125. In what position of the spout can you get a sidewise movement of the end of the spout without getting a rising movement, assuming that the movement is away from the middle or neutral position?

A. The spout describes a very slight curve as it comes down here.

X Q. 126. I am not talking about the up and down movement of the end of the spout, which is to be accomplished around the axis which is furnished by the ears 5, but I am assuming that we are taking the apparatus in the position which is shown by this print G-1184, and I want to move the lower end of the spout sidewise through an angle of 90 degrees. Where will the end of the spout be, so far as its vertical position is concerned, when you have accomplished that 90 degrees sidewise movement?

A. As near exact the same height as can be.

By Mr. Jones: Counsel for defendants protests against this unnecessarily long hypothetical examination as to what might happen [fol. 436] with this apparatus. The witness has testified as to what the apparatus actualy did in practice, and if paintiffs' counsel does not agree with this operation, he is invited to produce a model demonstrating what he evidently considers to be the inoperativeness of the device. The questions are very confusing in view of the detached relation of the parts on the drawing, and the witness is advised that if he wishes he may answer these questions by making a rough assembly sketch illustrating his answers.

By Mr. Hood: Counsel for defendants has produced this witness and attempted to qualify him as an engineer. Counsel for plaintiffs protests against the improper interference with the cross-examination.

X Q. 127. You are willing to stake your reputation as an engineer on the correctness of your last answer, are you?

By Mr. Jones: Question objected to as immaterial.

A. There is a slight difference in height.

X Q. 128. You are sure there is only a slight defference?

A. All the difference is due to the angle of offset of the ears 3 from the plane of the ring 2 at 90 degrees.

X Q. 129. Now, Mr. Stinson, I don't want to get you confused, nor to take any advantage of any possible confusion, and so I am

going to ask you if it isn't a fact that if you should take this precise apparatus that is illustrated in print G-1184 and swing the lower end of the spout to one side or the other from the plane in which the apparatus is illustrated in this print, and you carried that movement through an angle of 90 degrees about the axis, the long axis [fol. 437] of ring 4, the lower end of the chute or spout would then be up on a level with the upper end of the spout, and the spout would no longer be inclined downwardly, but would be horizontal?

By Mr. Jones: It is suggested that the question state whether the spout is to swing in a single plane only at right angles to the plane of the blue-print, or in some other plane in this assumed movement.

By Mr. Hood: The question assumes that there will be no change in the angle of the boom and no change in the length of the suspension means which connects the upper end of the boom with the chute.

A. The level position of the spout can't be swung.

X Q. 130. Please read the question.

A. I can't answer the question after reading it again.

X Q. 131. You mean that you have made the best answer you can make to X Q. 129?

A. As I understand that question, that is the best I can do. The spout will not swing in a level position beyond the range of the gimbel joints. This is the limit (witness points to print G-1184).

X Q. 132. You mean that the full line position of the inclined spout shown in print G-1184 is the highest position to which the spout can be swung in the plane of the drawing?

A. It is the highest position that the spout worked satisfactorily under a shop test.

X Q. 133. But isn't it a fact that with the parts shown in the full line position in print G-1184, if you tried to swing the spout to one side or the other, the lower end of the spout would rise?

A. The spout would rise in that position.

[fol. 438] X Q. 134. And if you attempted to swing the spout as much as 90 degrees to one side of the plane of print G-1184, the lower end of the spout would at the end of the 90° movement inevitably be raised so as to be level with the receiving end of the spout if the joint which you have called the gimbel joint would permit any such movement?

A. No.

X Q. 135. You are right sure of that, are you?

A. Experiment shows different.

X Q. 136. And you are right sure of that?

A. Yes.

X Q. 137. Now, isn't it a fact, Mr. Stinson, that the only sidewise movement of the delivery end of the spout is permissible because of the pivotal mounting of the ring 2 upon the ring 4, and that the axis of that pivotal mounting, which permits sidewise movement of the spout, is an axis which at all times is at right angles to the face of the tower or gallery?

A. That is correct, at right angles.

X Q. 138. When the spout is in the position shown in dotted lines in print G-1184, any sidewise movement of the lower end of the spout is accompanied by an upward movement of the lower end of the spout, isn't it?

A. At this radius, yes, sir.

X Q. 139. Well, the radius would be whatever the length of the spout is?

A. Whatever the length is, yes, sir.

X Q. 140. And a sidewise movement of 90° would inevitably bring the discharge end of the spout up to the point of the pivotal axis about which the sidewise movement takes place, wouldn't it?

A. That is an impossible position; it can't be done with that spout.

[fol. 439] X Q. 141. And that impossibility of movement is due to the fact that rings 2 and 4 will be limited in their swing because of the projection of the fixed spout down into the rings; isn't that right?

A. Not exactly, that is one objection.

X Q. 142. Well, then, as a matter of fact the apparatus which is shown in this drawing G-1184, that is an apparatus built in accordance with this drawing, will not possibly permit a swinging of the lower or discharge end of the inclined spout or chute from side to side through an angle of 180°, or anywhere near it?

A. Yes, when the angle of the spout does not exceed 45°.

X Q. 143. Well, now let us assume that the downward inclination of the spout is 45°, that is, half way between horizontal and vertical; now do you wish to be understood as saying that an apparatus built in accordance with the showing of print G-1184, you could swing the lower end of the inclined chute, this 45° inclined chute, from side to side through an angle of 180°, so that at one side of its swing it would lie parallel with the tower or dock and at the middle of the swing it would be projecting at right angles to the line of the dock, and at the other end of its swing it would lie again parallel with the dock?

A. They are performing that very function through 170° arc. Fifty-one of these are doing that.

By Mr. Jones: The questions are objected to, because in some instances they assume movement about a single pivotal support only, and in other instances they bring in both supports, which is possibly responsible for the unnecessarily long cross-examination on this point.

By Mr. Hood: The statement of counsel for defendants is not supported by the questions.

[fol. 446] X Q. 144. And under the conditions assumed in the preceding question you think the lower, or discharge, end of the chute will always be at substantially the same height or level?

A. That is the case as they are working in New Orleans.

X Q. 145. In actual use in loading ships the sidewise swing,

which is necessary for the loading operation, is comparatively little is it not?

A. No, they swing about 45° from the cross line of the dock, usually about three hatches are reached.

X Q. 146. When the chute was swung to one side or the other from its neutral or central position, was it necessary to hold it in the displaced position by some external holding means?

A. Due to the fact that the pivotal center of the spout is purposely placed back of the upper and lower supports of boom, the natural tendency is for the spout to span direct out, or at an angle of 90° to the gallery.

X Q. 147. I understood you to say that you had seen apparatus such as illustrated in print G-581 as early as 1904; are you sure of the year 1904?

A. 1901; this is similar. (Witness refers to Defendants' Exhibit 38.)

X Q. 148. In the apparatus illustrated in Defendants' Exhibit 38, why was the boom laterally offset from the chute, and what was accomplished by that lateral offsetting?

A. This spout was intended to swing one way only, and the offset was to prevent swinging in the wrong direction.

X Q. 149. And in this apparatus, Exhibit 38, there was the normal tendency, due to gravity, for the spout to stick straight out from the apparatus, that is, to occupy a neutral position, as illustrated in the two sheets of drawings forming Defendants' Exhibit 38?

[fol. 441] A. Yes, sir, that is done to control the neutral position.

X Q. 150. When did you last see the Portland, Maine, apparatus about which you have testified?

A. About four years after the job was completed, that would be about 1905—the early part of 1905. I am wrong on that date, it was a year later, I think it was 1906.

X Q. 151. That is the last time you saw that Portland apparatus was in 1906?

A. Yes, sir.

X Q. 152. When did you last see the New Orleans apparatus about which you have testified?

A. About a year and a half ago.

X Q. 153. In the New Orleans apparatus and in the Portland, Me., apparatus, about which you have testified, the step for the boom was a fixed step vertically?

A. Both of them were fixed steps.

X Q. 156. I suppose there is no reason why, in your opinion, the apparatus which is shown in Defendants' Exhibit 38, or that shown on print G-1184 could not be used for chuting concrete, if the concrete was wet enough; is that right?

A. I have very little knowledge about spouting concrete, but see nothing to prevent it from running in that spout.

X Q. 157. My question had in mind the apparatus as a whole; would your answer be any different?

A. I know no reason why it should not.

X Q. 158. You have been engaged in structural operations involving the placing of concrete in various positions and forms during the past twenty years; have you not?

A. Yes.

[fol. 442] X Q. 159. When did you first use chutes, through which you spouted a wet concrete mixture?

A. I never have to any extent.

Cross-examination closed.

Redirect examination by Mr. Jones:

R. D. Q. 160. In case you have not already stated, will you please state again when the drawings for prints G-1184 and F-825 were made?

A. Early in 1905.

R. D. Q. 161. Is this recollection of yours aside from the date appearing on one of the drawings?

A. Yes, sir, and there is other evidence I have that that was the year.

R. D. Q. 162. In the Portland apparatus of Exhibit 38, why did you you wish the boom to swing only through a quarter of a circle?

A. There was no means of reaching a ship through any other angle.

R. D. Q. 163. That was a special case, then?

A. A special case.

R. D. Q. 164. During your cross-examination I prepared a rough sketch intended to be based on your answers relating to the gimbel joint for the New Orleans spout; aside from exaggerations of proportions, is this sketch approximately correct as to the relative arrangement of the various rings and other parts?

A. Yes, sir.

The sketch is marked for identification "Defendants' Exhibit 39."

R. D. Q. 165. Do you recollect when the drawings of Exhibit 38 were made?

A. About 1900 and 1901. They were commenced probably in 1900 and completed in 1901.

[fol. 443] R. D. Q. 166. Did you have anything to do with the making of them?

A. Only in a general way; I was on the construction work.

R. D. Q. 167. Do they embody your ideas?

A. I originated that boom (W. W., 946) as applied to a grain spout. I have also made some models, which we tried out before adopting them.

R. D. Q. 168. Will you make a model of the gimbel arrangement to demonstrate its operation?

A. Yes.

R. D. Q. 169. You state that the inclined spout in print G-1184 projected down into the ring 4; were you referring to the blue-print, or relying on your memory for this feature?

A. It has to go into the ring, otherwise the grain would leak out on the side in an angular position.

R. D. Q. 170. It did not project in very far?

A. No.

R. D. Q. 171. In actual practice, does it interfere with the full swing?

A. It never touches it at this angle. The angle shown on this drawing, which is, I think, about 50°.

(Witness indicates the spouts.)

Recross-examination by Mr. Hood:

R. X Q. 172. When you originated the boom in connection with the grain spout, as you have already testified in connection with Exhibit 38, I suppose you thought you had produced a pretty ingenious piece of apparatus?

A. I did not think anything of the kind. Spouts had always been handled by the ships' gaffs or booms. I merely transferred the ship boom, making it lighter, and almost copying it identically,—to the side of the building, and put in a light winch to handle the spout, [fol. 444] the same to take the place of the donkey engine which previously had been used on the ship deck.

Recross-examination closed.

Re-redirected examination by Mr. Jones:

R. D. Q. 173. In modern concrete spouting apparatus which you have seen, wherein an inclined chute projecting downward from a tower is supported by a boom, is there anything materially different between such supporting arrangement and those which you have been tsetifying about in connection with grain elevators and ships?

A. I never examined them sufficiently close in detail to justify a positive statement; but I always supposed they were the same.

Deposition closed.

Signature waived.

Adjourned until Wednesday, February 16, 1921, at 10 a. m.

Chicago, February 16, 1921.

Parties met pursuant to adjournment; present as before.

HOWARD C. BLAKE, a witness produced, sworn and examined on behalf of defendants, deposes and testifies as follows, in answer to questions by Mr. Jones:

Q. 1. Please state your name, age, residence and occupation.

A. Howard C. Blake; thirty-six years; 4647 Greenwood Avenue, Chicago, Illinois. I have charge of the construction department of Morris & Company, packers, Chicago.

Q. 2. Please outline your past experience to date.

A. I got through Engineering College on 1906; went to California [fol. 445] in the spring of 1906, getting there three days after the earthquake. I went there as construction superintendent for an eastern firm to generalize myself on construction conditions and methods, and material conditions, as they expected to establish an agency there. I spent the following three and a half years in San Francisco and Los Angeles on construction work throughout the state. In 1910 I located in San Francisco on construction work for approximately two and a half years; then returned to Los Angeles, and was engaged in general construction engineering work until 1917, the outbreak of the war, when I entered the army in the Engineering Corps and went to France, returning to America, in July, 1919. My duties in France were chiefly construction. I had charge of the construction of Givres. I am now engaged with Morris & Company, in charge of their construction engineering department.

Q. 3. While in California, what facilities did you have for inspecting concrete work under erection?

A. I was sent there, particularly, to familiarize myself with conditions, and was furnished the necessary funds for expenses that this would cost; and I spent a great deal of the time going through California visiting the different buildings under construction, acquainting myself with architects, engineers, &c., so as to be thoroughly familiar with conditions when the firm did come west. I spent most of my time on this purpose, although I was also engaged in construction work as superintendent of construction in San Francisco, and later in Sacramento.

Q. 4. For what company were you superintendent of construction?

A. The Thompson-Starrett Company and the James Stewart Company. My connection with the Thompson-Starrett Company was [fol. 446] more in the light of a general utility man, to keep the several jobs well supplied with the necessary material, labor, &c., while with James Stewart & Company I was located on the Emporium Building, on the construction end. Later on, when I returned in 1910, I was associated as superintendent of outside construction with the Pacific Gas & Electric Company, during which period we built five reinforced concrete substations.

Q. 5. Are you familiar with the building activity which followed the earthquake in San Francisco?

A. Yes, I spent a great deal of my time—particularly the two years following the earthquake—in connection with the different investigations and reports that were made, due to the action of the earthquake and fire, on construction materials and methods.

Q. 6. About when was the earthquake?

A. About April 18, 1906.

Q. 7. What was the prevailing method of placing concrete in buildings built about the time of the earthquake or prior thereto?

A. What was considered the best method at that time was the Ransome system, consisting of a mixer, hoist, hopper and distribution by wheelbarrows.

Q. 8. Outline briefly the effect of the earthquake on the buildings

existing at the time, and its effect on the practice with reference to building concrete buildings thereafter.

A. The first part of that question is difficult. There are so many different types of buildings in old San Francisco, but, roughly, the most decided change, I believe, was the general adoption of more concrete in the construction of the new buildings. As a rule concrete was substituted for former brick and tile construction wherever possible. Shortly after the earthquake two types of buildings were [fol. 447] officially recognized by San Francisco, and generally throughout California, i. e., class A type, which consisted of a steel frame fireproofed by concrete; and class B building, which consisted almost entirely of reinforced concrete. This necessitated the more general use of wetter concrete than had been practiced heretofor, as walls and floors and fireproofing were of the minimum thickness allowed by safety, and could not be constructed with the older methods of dry concrete. The greatest change in the concrete construction at this time was the use of small reinforcing bars in place of larger reinforcing bars and a much wetter mixture for pouring the concrete.

Q. 9. What buildings withstood the earthquake and fire the best?

A. The three buildings that I am most thoroughly acquainted with were the Merchants Exchange Building, the Monadnock Building, and the Call Building. I think the name of this latter building has been changed since, but that was the name at that time. Those buildings were all of the larger, better type of building in San Francisco at the time of the earthquake, and of the three the Call Building stood the action of the fire the best. The Merchants Exchange stood the action of the earthquake quite well, but suffered from the fire. It had tile fire-proofing, and considerable damage was done to it. It is difficult to compare the buildings, because the fire conditions were different in the different parts of the city.

Q. 10. Were any of these buildings made of concrete?

A. There were none of them made entirely of concrete.

Q. 11. How extensively did you travel during the first four or five years you were in California?

A. For the first three years and a half I traveled about every three months from San Francisco to Los Angeles, and the trip was usually in the neighborhood of two weeks.

[fol. 448] Q. 12. Did you visit any other parts of the Pacific coast?

A. Occasionally I went up to Portland and Seattle and through British Vancouver, and down into Texas. I was not so much interested in the construction work of the north as I was of California proper.

Q. 13. Did you ever hear of the Timken Building in San Diego, or the Majestic Building in Los Angeles?

A. I have seen both buildings, and was at the Majestic Building in Los Angeles during its construction, and at the Timken Building, San Diego. I was more interested in the Majestic Building than in the Timken Building.

Q. 14. About when did you first see these two buildings?

A. I saw the Majestic Building in either February or March,

1908, along in that period—first quarter of the year—and the Timken Building in San Diego in the summer of the same year.

Q. 15. Do you recall seeing used on either of these buildings any concrete-distributing apparatus different from what was customarily used at that period elsewhere?

A. I do not recall having seen anything of that caliber on either building; yet I believe if there had been anything unusual I would have seen the same at the time I visited the building.

By Mr. Hood: That portion of the answer beginning with "yet I believe," and continuing to the end of the answer, is objected to as volunteered.

Q. 16. Did you take particular note of such apparatus as was used?

A. No, I have no recollection of the apparatus that was used.

Q. 17. To what extent did you keep in touch with developments in concrete construction work during the years 1908, 1909 and 1910, for example?

[fol. 449] By Mr. Hood: Question objected to as immaterial in so far as it relates to the years 1909 and 1910, on the ground that everything subsequent to January 21, 1909, is subsequent to the date of the application for patent on which the letters patent in suit were issued.

A. I made a definite point of endeavoring to keep familiar with all construction methods and conditions during this period.

Q. 18. State more specifically how you did this.

A. Through three chief channels—engineering periodicals, the local engineering societies, and my own trips.

Q. 19. While you were on the coast, did you know anything about the Concrete Appliances Company or the Engstrum Company?

A. I knew the Engstrum Company, or rather the older Mr. Engstrum very well. The Concrete Appliances Company I did not know.

Q. 20. While on the coast, did you ever see or hear of concrete-distributing apparatus comprising a tower, a hoist, and a hopper with a chute extending downwardly and outwardly from the hopper and supported by a swinging boom mounted on the tower?

A. We had a number of apparatuses of that or similar construction in use all through the Pacific coast, but more frequently, I should say, in the southern California district, during the period of 1912.

Q. 21. During what period did you have headquarters in Los Angeles?

A. My headquarters in Los Angeles was during the latter part of 1912 on through to 1917.

Q. 22. During the period prior to 1912, did you ever hear of any apparatus such as you have just referred to, including a boom, used by the Engstrum Company?

A. Not to my knowledge, I do not remember ever having seen any

[fol. 450] such apparatus during the period that I was in Los Angeles, up to the middle of 1909.

Q. 23. Were your relations with the Engstrum Company such that you might be expected to know of any radically new apparatuses they were promoting?

A. Mr. Engstrum knew the reasons for my trips and was acquainted with my eastern connections, and that is the reason I presume that anything that was new or of advantage in the market would have been mentioned to me by him. We talked over many things connected with the concrete lines, and I have no recollection of his bringing up anything about concrete-distributing systems, although we talked about concrete methods.

Q. 24. What can you say as to the work of the Pacific Gas Light & Electric Company during the year- 1908-1910?

A. We started running from Berkley through the northeast, doing the work with our own men and material. At that time I had charge of the construction of these buildings. We used a home-made hoist, a hopper, and trough-distributing system supported by a gate, or similar to the chute constructed with a gate or horse on the end, dumping the concrete into the wheelbarrows or into the forms, as was necessary, directly from the hopper. I believe that if any apparatus had been on the market that would have been cheaper for us to have used, we would have used it. To my best knowledge we were never approached with any of these.

Q. 25. If you dumped the concrete directly from the hopper into the wheelbarrows, what function did the chutes perform?

A. We dumped it from the hopper to the wheelbarrows directly for the foundation work and till the walls reached a height equal to the height of the mixer mouth. The trough was not used for these operations.

[fol. 451] Q. 26. Under what conditions did you use the chutes or troughs?

By Mr. Hood: The question is objected to as relating to occurrence subsequent to the date of filing of the application upon which the patent in suit was issued; and it is agreed that this question will be considered as entered to all questions relating to occurrences subsequent to said date.

A. After we got above the height of the mixing mouth of the walls, we erected a hoist and hopper, placing the hopper about 12 feet above the roof level, directed our concrete through the hoist into the hopper, and distributed it from the hopper to the wheelbarrows or walls by the chutes, where the chutes were long enough to reach the walls.

Q. 27. When and where did you do this?

A. I did this at Berkeley, Cal., San Rafael, Cal., Petaluma, Cal., during 1909, I should say.

Q. 28. Did you ever know a contractor named "Fellows" on the Pacific coast?

A. Yes, I knew Mr. Charles A. Fellows in Los Angeles.

Q. 29. Do you know anything about any of the structures under erection in the photographs which I hand you?

A. I do not know anything about No. 1 while it was under construction. I know the building as completed, station and hotel at Barstow. I know the Sante Fe depot at Redlands, No. 2. I don't know what No. 3 is at all. No. 4 is the same as No. 2. No. 5 I do not know in this view. No. 6 the same answer. No. 7, I know the Sante Fe buildings, at San Bernardino, of which the store house is one. I do not know this view.

By Mr. Hood: The answer is objected to as relating to matters not properly pleaded.

[fol. 452] Q. 30. Do you know where these photographs came from?

A. I have seen a letter to you from Mr. Fellows mentioning the photographs as sending them to you.

By Mr. Hood: Objected to as irrelevant, immaterial, and lacking in every possible element necessary to identify either the photographs or any of the structures supposedly illustrated thereby.

By Mr. Jones: To identify the photographs for later reference, they are marked "Defendants' Exhibits 40, Photographs of Pacific Coast Structures."

Q. 31. Did you see the Richmond roundhouse under construction in California?

A. I did not.

Direct examination closed.

Cross-examination by Mr. Hood without waiving objection:

X Q. 32. What was the full name of the Mr. Engstrum to whom you have referred?

A. F. O. Engstrum used, and I have always understood his name was Fred.

X Q. 33. How old a man was he at that time?

A. I have no personal knowledge, but I should say about fifty-eight years of age.

X Q. 34. In 1908?

A. Yes.

X Q. 35. How often did you meet this Mr. Engstrum in January, 1908?

A. I do not believe I met Mr. Engstrum in January, 1908.

X Q. 36. When did you first meet Mr. Engstrum?

A. I think it was in the late summer of 1906.

X Q. 37. When did you see this Mr. Engstrum for the first time in the year 1908?

[fol. 453] A. I am not certain as to that, but I believe it was during August. I would like to change that "August" to the latter part of the summer.

X Q. 38. Where did that meeting take place?

A. I think it was in the office of Mr. Parkinson, architect, in Los Angeles.

X Q. 39. How long did you talk to him at that time?

A. There was a conference there between Mr. Engstrum and Mr. Parkinson, and I spoke to Mr. Engstrum several times during the meeting—a matter of fifteen or twenty minutes, probably.

X Q. 40. You mean that this conference lasted about fifteen or twenty minutes?

A. No; the conference lasted considerably longer than that. Fifteen or twenty minutes applied to the length of time Mr. Engstrum and myself talked.

X Q. 41. What was the subject-matter of that conference?

A. Primarily cement.

X Q. 42. How did you happen to be in attendance at that conference?

A. One of Mr. Parkinson's chief engineers was a school-mate of mine, and I had merely dropped into the office to see him, and took the opportunity of asking Mr. Engstrum's advice on the European cements.

X Q. 43. Did you see or talk to this Mr. Engstrum during the month of December, 1907?

A. No.

X Q. 44. How often have you talked with Mr. Engstrum between the time you first met him in 1906 and the time you met him in Mr. Parkinson's office in the latter part of the summer of 1908?

A. About five times.

X Q. 45. Approximately when were these?

A. Twice in 1906, at least twice in 1907, and the other time in 1908.

[fol. 454] X Q. 46. What was the occasion of your first meeting with Mr. Engstrum in 1906?

A. To present a letter of introduction to Mr. Engstrum.

X Q. 47. And how long did you talk to him at that time?

A. Possibly half an hour.

X Q. 48. What time in 1906 did you next see Mr. Engstrum?

A. In the summer of 1906.

X Q. 49. Where did that meeting take place?

A. It was in Los Angeles, at the yards they held—I don't know the location of those yards.

X Q. 50. Did you ever meet a Mr. F. E. Engstrum?

A. I have met a son of Mr. Engstrum—whom I understand to be a son of Mr. Engstrum, I do not know his initials.

X Q. 51. Will you please briefly describe the man whom you met and understood to be a son of Mr. F. O. Engstrum?

A. My remembrance is vague. I would say he was about 5 feet 8 inches or taller, and of fairly heavy build, and I believe he was clean shaven.

X Q. 52. About how old a man would you have taken him to be at that time?

A. I don't know as I have any recollection.

X Q. 53. Where did you meet the younger Mr. Engstrum, and when?

A. When I met the younger Mr. Engstrum? At one of the local engineering meetings in Los Angeles. I believe I met him there; my recollection is very vague, as I never had any personal or business dealings with him. I don't remember when I met him, except that it was after 1912. If I met him before then I have no knowledge.

[fol. 455] X Q. 54. How long did your second interview with Mr. Engstrum, Sr., last?

A. I don't believe I know definitely, but they were practically all courtesy visits, with the exception of this particular visit when I asked his advice on the cements. I think I was usually with him for half an hour on, depending on how busy he was.

X Q. 55. What is your recollection as to the times and places of the two or three interviews you had with the elder Mr. Engstrum during the year 1907?

A. I believe that I met Mr. Engstrum, outside of the original meeting and the meeting in Mr. Parkinson's office, in the offices of the Engstrum Construction Company. I think my two visits to Los Angeles in 1907 were in the spring and early autumn.

X Q. 56. Are you unable to give the months of the year 1907 when these visits took place?

A. I cannot, for the spring; I believe it was in the month of September in the fall.

X Q. 57. At the time of your fifteen minute talk with the elder Mr. Engstrum in the latter part of the summer in 1908 in Mr Parkinson's office, Mr. Engstrum was in conference with Mr. Parkinson relative to matters which were not any part of your business; is that right?

A. That is correct; that is, I presume he was with Mr. Parkinson, he was in Mr. Parkinson's office.

X Q. 58. That is, Mr. Engstrum was in Mr. Parkinson's office at the time you arrived in Parkinson's office; is that right?

A. Yes.

X Q. 59. And he was engaged in a conference?

A. Yes.

X Q. 60. So that your inquiry about European cement was rather in the nature of an interruption in that conference which Mr. Engstrum was holding?

[fol. 456] A. No, Mr. Engstrum simply gave me his spare time in the office.

X Q. 61. That is, while Mr. Engstrum was primarily engaged in a conference in the Parkinson office, he was able to give you some spare time?

A. He would come out from the inside office and talk to me, and go back again when he was called.

X Q. 62. Now, as I understand it, you have no recollection of the kind of apparatus that was used to handle the concrete in the fabrication of the Majestic Building in Los Angeles; is that right?

A. That is correct.

X Q. 63. When did you first visit the Majestic Building site?

A. During the first quarter of 1908—the latter part I believe, though I am not certain.

X Q. 64. What was the condition of the building at that time?

A. I should say the rough frame of the building was about 25 per cent completed.

X Q. 65. How many stories were completed at the time of your visit?

A. They were working on the second story.

X Q. 66. Do you mean by that that they were working at the level of what would be called the second floor, or the first floor above the ground level?

A. Yes.

X Q. 67. What was the character of this construction?

A. My impression is concrete and steel.

X Q. 68. Can't you give a little more definite description?

A. I mean by that steel frame and concrete floors.

X Q. 69. Were the columns steel or concrete?

A. I think all of the columns were steel, and also the trusses.

[fol. 457] X Q. 70. Were the columns encased in concrete?

A. I don't remember seeing any columns encased in concrete.

X Q. 71. There were steel beams or girders extending from column to column at each floor level; were there?

A. I don't recollect anything except the truss that was of steel.

X Q. 72. Were there concrete girders or beams extending from column to column at the floor levels?

A. There was concrete construction, but I do not remember the type of design.

X Q. 73. What character of reinforcement was used in the floor slabs?

A. I have no recollection.

X Q. 74. And during this visit in the latter part of the first quarter of 1908, did you go on to the work under construction?

A. I tried to see as many of the types of buildings as was possible, primarily for later checking of the cost of this work.

X Q. 75. I asked you if you went on to the work under construction?

A. This particular building?

X Q. 76. This particular building.

A. I was on this building to talk with the superintendent of the building.

X Q. 77. What was the name of the superintendent?

A. I have no recollection. I don't know as I heard his name.

X Q. 78. Did you talk with him?

A, Yes.

X Q. 79. How long?

A. In the neighborhood of fifteen minutes.

X Q. 80. Just where on the construction work did this conversation take place?

[fol. 458] A. I believe it was on the street level.

X Q. 81. Whereabouts on the street level?

A. I do not recollect. I walked into the building a short distance, and he met me—possibly 25 feet in the *the* building.

X Q. 82. Just where is this Majestic Building located in Los Angeles? (Witness pauses.)

A. It was about 400 Spring Street.

X Q. 83. Is it at the intersection of two streets?

A. No.

X Q. 84. How large a building is it, ground area?

A. I don't know what the depth of the building is. I should say the width was about 60 feet.

X Q. 85. And about where in the width of the building did you enter on the ground floor?

A. I don't believe I have any recollection at all.

X Q. 86. Your recollection of the details of this building and of this visit in the latter part of the first quarter of 1908 is pretty hazy, isn't it?

A. Of those particular details, yes. I didn't see anything that warranted me remembering anything. The information I was after was secured from the superintendent.

X Q. 87. How did you know he was the superintendent?

A. I presume I asked either him or somebody there.

X Q. 88. And what was the information you received?

A. Regarding the time of delivery of materials, means of securing materials, labor, and general working construction conditions.

X Q. 89. You mean by "time of delivery of materials" the period between the giving of an order and the time or arrival of the order of materials on the job, do you?

A. I do.

X Q. 90. When did you next visit the Majestic Theater after your [fo. 459] first visit in the latter part of the first quarter of 1908?

A. I doubt if I ever visited the building again.

X Q. 91. Do you know that the elder Mr. Engstrum is dead?

A. I don't know it definitely, and had not heard until just recently.

I believe that I made an error in the location of the Majestic Building. I should have said Broadway, between Sixth and Seventh. We always go by buildings out there and not numbers.

X Q. 92. You had been informed prior to today of the death of the elder Mr. Engstrum, had you?

A. Yes, I believe that information came to me within the last six months—I can't remember who gave it to me.

X Q. 93. What sort of equipment was visible to you on the Majestic Theater job at the time of your visit in 1908?

A. I have a recollection of material on the job, some forms standing, rock and sand, the usual appearance of a construction job under process.

X Q. 94. Where was the concrete mixer?

A. This is merely a thought, but I believe the mixer was in the front end of the building.

X Q. 95. Was there a hoisting rig?

A. My memory is vague on this point, but it seems to me that

they were working with a mixer and using the mixer. I do not remember any other parts of the concreting apparatus.

X Q. 96. From which direction did you approach the building?

A. From the front end.

X Q. 97. And from which direction along Broadway?

A. I presume from Sixth Street, as I had no occasion to be in the other end of town.

[fol. 460] X Q. 98. Were there existing buildings on either side of the theater site?

A. As I remember it, there were existing buildings on the north side,—the side towards Sixth Street.

Cross-examination closed.

Redirect examination by Mr. Jones:

R. D. Q. 99. How often after the summer of 1908 did you see Mr. Engstrum, Sr.?

A. I believe I saw Mr. Engstrum, Sr., once in the early part of 1909, on the Broadway Viaduct—I think they call it—where he had been having some trouble with some men. He talked with me at that time.

R. D. Q. 100. Do you recall whether you talked with any of the other men in Mr. Engstrum's organization during 1908 or later?

A. Mr. Engstrum introduced me to a number of them, but I had no dealings with any of Mr. Engstrum's Company, with one exception. I cannot recollect his name, but it was along about 1916.

R. D. Q. 101. Did you ever go above the first floor of the Majestic Building during erection?

A. No.

R. D. Q. 102. Aside from the visit you have referred to; did you ever have occasion to pass this building during its erection?

A. If I did, I have no recollection of it.

R. D. Q. 103. About when did you say you first saw or heard of chutes hung from a boom on a tower for concrete?

A. I don't believe I saw any or came in contact with them until about 1912.

Deposition closed.
Signature waived.

[fol. 461] HAROLD D. SQUIRES, a witness produced, sworn, and examined on behalf of defendants, deposes and testifies as follows in answer to questions by Mr. Jones:

Q. 1. Please state your name, age, residence and occupation.

A. Harold D. Squires; thirty-eight years; 745 N. Michigan Avenue, Chicago, Illinois. I am treasurer of the Metal Building Materials Company.

Q. 2. What is the nature of your business?

A. The manufacture of metal building specialties for concrete buildings.

Q. 3. What business were you in in 1906?

A. I was then treasurer of the William B. Hough Company, who were middle western agents for the Ransome Concrete Machinery Company, selling concrete mixers, and other concrete appliances, and reinforcing steel.

Q. 4. Can you identify Defendants' Exhibit 21?

A. This is a catalogue of the Ransome Concrete Machinery Company of New York, received by us, as indicated by our regular business stamp, on June 1, 1906.

Q. 5. What was the prevailing method of placing concrete in buildings at that time?

A. The prevailing method was the use of a wooden tower, in which was a hoist bucket which dumped into a hopper on floor level, and then distributed by means of carts or wheelbarrows to points desired. Also in the case of foundations, quite frequently troughs were used direct from the hopper or the mixer to the point of distribution in the foundations, these troughs generally being supported by wooden horses and moved by hand from point to point.

Q. 6. About how far could such trough reach?

By Mr. Hood: Objected to as asking for a statement of opinion rather than of fact.

[fol. 462] A. Depending upon the amount of drop to allow the concrete to flow, and consequently could be used to greater advantage in foundation work because of the greater drop they could get as against a floor level. In most cases the run did not exceed more than from 15 to 20 feet, although I have seen them carry it anywhere from 30 to 40 feet from the mixer or hopper.

Q. 7. Did you ever see in use, about that period, apparatus such as illustrated opposite page 42 of the catalogue Exhibit 21?

A. Yes, I saw at that time a great many in use, and we were selling, as a regular part of our business, the automatic dump bucket, hopper and carts, using that illustration, or a separate blueprint, for the contrateor to build his tower.

Q. 8. Where was the hopper supported?

A. The hopper was supported on the outside of the tower, the inside of the tower being used for the hoist bucket.

Q. 9. How high was the hopper above the mixer?

A. The hopper was slightly above the level of the floor to be poured, and was taken up to a new level for each succeeding floor, making the distances from the mixer variable according to the floor to be poured.

Q. 10. How was the hopper or bin raised in practice?

A. Unbolted from the tower, and raised by means of block and tackle, again being re-bolted in place.

Q. 11. Is William B. Hough living?

A. William B. Hough died a year ago last May.

Q. 12. Did the William B. Hough Company ever represent any concern other than the Ransome Company?

A. Yes, quite a number, among them being the Concrete Appliances Company, of Los Angeles, Cal., from November, 1910, until the William B. Hough Company went out of business in 1913.

[fol. 463] Q. 13. Please explain the character of your business with this company.

By Mr. Hood: The question is objected to as wholly irrelevant and immaterial, in view of the fact that the period during which the Hough Company, including this witness, is said to have represented the Concrete Appliances Company is subsequent to the date of the patent in suit; also because the matter inquired about is not properly pleaded. Counsel for plaintiffs calls attention to the fact that no notice of the proposed examination of this witness has been given to counsel for plaintiffs, and while he does not object to the continued examination, in spite of lack of notice, nevertheless the right to recall this witness for further cross-examination as to any matters of relation between the witness, the Hough Company and the Concrete Appliances Company, upon adequate notice, to counsel for defendants, is hereby reserved.

A. We were to sell the right to use the system which we advertised as the G-Y System on a royalty basis, and furnish blue-prints and sell or rent materials, such as pipe, swivel pans, and other apparatus for use with this system of pouring concrete.

By Mr. Hood: The answer is objected to as wholly irrelevant and immaterial to any of the issues of this cause.

Q. 14. Have you preserved any of your correspondence with this company?

By Mr. Hood: Objected to as wholly irrelevant and immaterial.

A. At the time of going out of business in 1913, I destroyed practically all our correspondence and kept only old book-keeping and other matters of record.

[fol. 464] Q. 15. How do you know that your connection began in November 1910?

By Mr. Hood: Objected to as irrelevant and immaterial.

A. In my files, among notations of agency agreements, I have there a notation to the effect that our agency with the Concrete Appliances Company ran from November, 1910, for a period of five years.

Q. 16. Can you produce any drawings of apparatus proposed or licensed by you about that period?

By Mr. Hood: Objected to as irrelevant and immaterial, and as relating to a matter not properly pleaded.

By Mr. Jones: Witness produces two groups of blue-prints, including also a pencil drawing, which groups are marked for identification "Defendants' Exhibit 41, Concrete Appliances Co. Apparatus," and "Defendants' Exhibit 42, William B. Hought Co. Apparatus."

By Mr. Hood: Objected to as wholly irrelevant and immaterial, not properly identified, and not properly pleaded.

Q. 17. Where did you get these two groups of drawings?

By Mr. Hood: Objected to as irrelevant and immaterial, and as relating to matter not properly pleaded.

A. From files of the William B. Hough Company which I have had in my possession since the William B. Hough Company went out of business.

Q. 18. Did the Concrete Appliances Company furnish or sell you any of the apparatus illustrated in these blue-prints?

By Mr. Hood: Objected to as irrelevant and immaterial, and as [fol. 465] relating to matter not properly pleaded.

A. The Concrete Appliances Company in the very beginning did furnish us with a swivel pan and a swivel for use at the end of the boom. From these and blue-prints which they sent us at that time we had material made up in Chicago. The blue-prints shown here in Exhibit 42 are not in all respects the same as blue-prints furnished us by the Concrete Appliances Company, as we found in practice that these would have to be changed and Exhibit 42 shows our revised prints.

Q. 19. Describe, briefly, the drawings of Exhibit 41.

By Mr. Hood: Objected to as irrelevant and immaterial, and as relating to matter not properly pleaded, and as relating to drawings not properly proven, or connected with plaintiffs herein.

By Mr. Jones: Since some of the tracings from which the blue-prints were made bear the name "Concrete Appliances Company, Los Angeles—St. Louis," opposing counsel is requested to produce the original tracings at the hearing if they are still in the files of the plaintiff company.

Counsel for plaintiff has not sufficient data to enable him to comply with the above noted request.

A. The first sheet, Concrete Appliances Co. Sheet No. 40, dated October 7, 1910, is merely a sheet for the calculation of strains. The second sheet, pencil sketch on white paper, dated September 9, 1910, shows the ironing for a 24-foot boom. This drawing was made in our office by Mr. Emtman. The third sheet, blue-print of the lay-out for a filtration plant at Grand Rapids, Mich., was one made by the chief engineer of the William B. Hough Company, dated January 11, 1911. The fourth sheet, blue print of the Concrete Appliances Company, dated April 30, 1910, Drawing No. 9 [fol. 466] and 10, is a blue-print given us for the making of pipe that went with this system. The fifth sheet, a blue-print of the Concrete Appliances Company,—date and number torn off—was given us at the time of signing the contract as an illustration of what could be done in this method of pouring concrete.

Q. 20. Who was Emtman that you referred to?

By Mr. Hood: Objected to as irrelevant and immaterial.

A. Mr. Emtman at the time that we knew him was a building superintendent, and it was my impression that he was the practical inventor of this method of pouring concrete.

By Mr. Hood: The surmise of the witness stated in the last answer is objected to as irrelevant, immaterial, and incompetent.

Q. 21. Is he the Theodore Emtman at Los Angeles, whose name appears as the assignor to the Concrete Appliances Company of St. Louis of patent 948,723, set up in the answer in this suit, a copy of which patent I show you?

By Mr. Hood: The question is objected to as irrelevant, immaterial, and incompetent.

A. Yes.

Q. 22. Do you recall who first made use of apparatus of this general character through the efforts of your Company, as agent for the Concrete Appliances Company?

By Mr. Hood: Question is objected to as irrelevant and immaterial, as incompetent and assuming, in view of the lack of any adequate showing of alleged agency; also as relating to matter not properly pleaded.

A. Witherspoon-Englar & Company, contractors of Chicago, on [fol. 467] a job in Texas, and A. Monstead & Company, contractors of Milwaukee, on a job in that city.

Q. 23. You have stated that it was found necessary in practice to change the apparatus shown in the blue-prints of the Concrete Appliances Company; why was this necessary?

By Mr. Hood: Objected to as irrelevant and immaterial and as relating to matter not properly pleaded.

A. On the first two outfits which we had rented, the customers both experienced considerable difficulty, and we were obliged to send men to Milwaukee, and also a man from Los Angeles went to the Texas job. He did not give them any relief, and Witherspoon-Englar suggested that we allow them to open up the pipes which we had furnished, so that they would form troughs. This we, of course, allowed them to do, and Mr. Whipple, superintendent for the Monstead Company, was obliged to do the same thing on his job. Also, both companies had trouble with the swivel pan, and with some of the ironing on the booms, necessitating nearly a complete revision by us of material to be used with this system. Witherspoon-Englar had so much trouble with their outfit that they used it on only a small portion of the job, refusing to use it on the remainder.

By Mr. Hood: That portion of the answer relating to the movement of a man from Los Angeles to the Texas job is objected to as hearsay. The second sentence of the preceding answer is objected

to as hearsay, or as not the best evidence. The remaining portion of the answer is objected to as secondary and not the best evidence.

Q. 24. Do you recall about when you sold the apparatus to these two companies?

[fol. 468] By Mr. Hood: Objected to as irrelevant and immaterial, as relating to matter not properly pleaded.

A. One job in December, 1910, the other in the early part of January, 1911. The Witherspoon-Englar job was first.

Q. 25. Refer briefly to some of the changes represented by the revised blue-prints, Exhibit 42.

A. Sheet numbered 2 (the top sheet), revised April 6, 1911, is a tower swivel pan, which we were obliged to make larger on account of stoppages and also a more steep bottom. The same is true of the mast pan, sheet No. 2a. Sheet No. 3 shows our design of a trough as against the pipe shown by Concrete Appliances Company. Sheet No. 5 shows the revision in pipe connections which we made on pipe used from the end of the boom. Sheet No. 12 shows the revision of strapping the boom to make it more rigid. The remainder of the changes are merely those of dimensions, or slight changes in design.

Q. 26. Does sheet 23, dated May 1, 1911, show a closed pipe or an open trough?

By Mr. Hood: Objected to as irrelevant and immaterial and relating to matter not properly pleaded. Attention is again called to the fact that all of the testimony of this witness relating to operations of the Hough Company, so far as they bear upon any apparatus involved in this case, took place subsequent to the date of issue of the patent in suit.

A. Sheet No. 23 shows an open trough in greater detail than sheet No. 3.

Q. 27. Do you remember these various changes, or are you entirely dependent on the blue-prints for your recollection?

By Mr. Hood: Objected to as irrelevant and as relating to matters not properly pleaded.

[fol. 469] A. I remember the changes in general, but would need the blue-prints to refresh my memory on minor points.

Q. 28. Do you know who made the tracings from which these blue-prints, Exhibit 42, were reproduced?

By Mr. Hood: Objected to as irrelevant and immaterial and relating to matter not properly pleaded.

A. They were made by draftsmen in our office from data given by our chief engineer, and the tracings were checked by him, H. Hinez.

Q. 29. During this period that you were representing the Concrete Appliances Company, was your company successful financially?

By Mr. Hood: Objected to as irrelevant, immaterial, relating to matter not properly pleaded, and as assuming a fact not properly proven.

A. No, we lost considerable money on this phase of our business, owing to the amount of money that was spent for advertising for our salesmen, and owing to the fact that all the material that we rented on the first two jobs had to be entirely scrapped.

Q. 30. Aside from the swivel pan and swivel, furnished you at the very beginning, how much of this equipment, was furnished you by the Concrete Appliances Company during the remaining years?

By Mr. Hood: Objected to as irrelevant and immaterial.

A. None.

Q. 31. Explain the renting of material referred to in an earlier answer.

By Mr. Hood: Objected to as irrelevant and immaterial, as re-
[fol. 470] lating to matter not properly pleaded, and as relating to operations not properly connected with any of the parties to this cause.

By Mr. Jones: Defendants' counsel is willing to stipulate that this objection may apply to any of the witness' testimony relating to the sale or rental by them of apparatus during this four-year period, in order to avoid encumbering the record with such frequent objections and to avoid the unnecessary expense of printing so many repetitions.

While counsel for plaintiffs appreciates the offer just made, he feels that he must be the judge of the manner in which proper objection to the examination of the witness shall be made of record.

A. Under our contract with the Concrete Appliances Company we were to license the use of this system on a royalty basis of so much per yard, furnishing the user with the general lay-out, and either giving him blue-prints from which he could make up his own material, or else make this material ourselves and sell or rent as we saw fit.

By Mr. Hood: The answer is objected to as not the best evidence.

Q. 32. What did you actually do towards carrying out this contract?

By Mr. Hood: Objected to as irrelevant and immaterial and relating to matter not properly pleaded.

A. We sold licenses to use the system at a royalty per yard of concrete poured, and rented all material for the use in this system, with the exception of cable, the wooden towers and the wooden boom, these last of which the user himself furnished. We did, however, give them blue-prints from which the user could build his towers and wooden booms.

[fol. 471] Q. 33. Who was the party primarily responsible for the changed apparatus represented by the revised blue-prints of Exhibit 42?

By Mr. Hood: Objected to as irrelevant and immaterial and as relating to matter not properly pleaded.

By Mr. Jones: Defendants' counsel calls the attention of the court to these repeated objections, despite the foregoing offer of stipulation.

A. The William B. Hough Company, through reports received through their men whom they had sent to the jobs in trouble, and in one or two cases from the suggestion of the user himself.

Q. 33a. Did Theodore Emtman or the Concrete Appliances Company suggest any substantial changes?

By Mr. Hood: Objected to as irrelevant and immaterial and relating to matter not properly pleaded.

A. Not that I remember.

Q. 34. Have you any photographs illustrating the apparatus used by your customers at this period?

By Mr. Hood: Objected to as irrelevant and immaterial and relating to matters not properly pleaded and to operations not connected by any proper proof to any party to this cause.

A. Yes, I have a few.

(Witness produces two photographs which are marked jointly "Defendants' Exhibit 43, Photographs of William B. Hough Co.")

By Mr. Hood: The exhibits are objected to as irrelevant, immaterial, as relating to matter not properly proven.

Q. 35. Where did you get these photographs?

Objection to Q. 34 repeated.

[fol. 472] A. I got them from among job photos of the William B. Hough Company.

Q. 36. Are they typical of any apparatus rented or licensed by you during the four-year period in question?

By Mr. Hood: Objected to as irrelevant and immaterial, and as relating to matter not properly pleaded, and as relating to operations not properly connected with any party to this cause.

A. They are typical of all installations sold, the top photograph showing the method of carrying the concrete from the main to a sub-tower, together with the method of distributing from the tower and boom; and the second photograph showing more plainly the tower and boom only, with the trough from the hopper, the swivel joint at the end of the boom, and the distributing pipe that placed the concrete.

Q. 37. In an installation of this character, what parts of the apparatus did you actually sell to the user?

By Mr. Hood: Objected to as irrelevant and immaterial.

A. We didn't sell any of it; we merely rented, sending to the user the automatic hoist bucket, the hopper, the troughs, the necessary pipe, hopper pans, boom pans, swivel pans, all ironing for the booms and tower,—practically everything that was metal, with the exception of the steel cable used for guying the towers and suspending trough and boom. The user himself supplied all the wood necessary and built the tower and the booms.

Q. 38. How was the pipe supported which extended downwardly at an angle from the tower, as illustrated in the blue print Exhibit 42?

By Mr. Hood: Objected to as irrelevant and immaterial; as relating to matter not properly proven and not properly connected with [fol. 473] any party to this cause.

A. The trough from the tower to the end of the boom was supported between two steel cables, which were drawn taut by means of block and tackle at the tower.

Q. 39. Is this shown in Sheet 17a of this exhibit?

By Mr. Hood: Objection to answer to Q. 38 repeated.

A. Yes.

Q. 40. And before you changed from a pipe to an open trough, how was the pipe supported?

Objection to Q. 38 repeated.

A. In the same manner, though one or two users did change the method.

Q. 41. What are the inclined members extending upwardly from the boom to the pipe or chute in the photograph Exhibit 43?

By Mr. Hood: Objected to as irrelevant and immaterial.

A. Those are props to take out the sag in the trough line, as the user evidently was not able to draw his cables taut enough to give a straight flow of concrete.

By Mr. Hood: In view of the character of the last answer, it is objected to as not the best evidence, the witness quite apparently not having personal knowledge of the particular matter inquired about.

Q. 42. Was the boom seat or swivel connection, shown on sheet 8 of Exhibit 42, secured permanently to the tower, and if not, how could its position be changed?

By Mr. Hood: Objected to as irrelevant and immaterial and relating to matter not properly proven and to apparatus not properly connected to any party to this cause.

[fol. 474] A. It was secured directly to the tower by means of bolts, and when raised had to be unbolted and raised with block and tackle in the same manner that the Ransome hopper was.

Q. 43. What objections, if any, were raised by prospective customers with reference to the use of this apparatus, the use of which you were attempting to sell them?

By Mr. Hood: Objected to as irrelevant and immaterial, as assuming efforts on the part of the witness contrary to his previous testimony, and also as relating operations subsequent to the date of the patent in suit and not properly connected with any party to this cause.

A. In our first installations we had numerous objections as to the way the apparatus worked. We later on had objections in some cases that it cost more to use this method than to use the old tower dump bucket and cart method.

By Mr. Hood: The answer of the witness is objected to as hearsay. Alleged statements by an unknown party, not parties to the record, cannot be proven by this witness.

Q. 44. Were any objections raised to the general scheme of discharging concrete through pipes or chutes?

Objected to as irrelevant, immaterial, and as calling for hearsay.

A. We did have some objections by engineers that in chuting concrete by gravity the aggregates would not remain as mixed, the heavier material or stone getting into place first. After use, in pouring concrete in this manner, however, we never had objections.

Q. 45. At the time you first represented the Ransome Company [fol. 475] in 1906, was the concrete of about the same consistency as what is used today in spouting?

A. Back in 1906 the Government used specifications which called for a very dry mix. It was later found, however, on experiment that concrete developed less cracks and greater strength by being what is now called a "sloppy mix." Specified quantities of water for given aggregates are now universally known, and is much more wet than in 1906.

Q. 46. Did any of your customers during the three or four-year period previously referred to use the apparatus shown on the top blue print of Exhibit 41, showing a mast on top of the tower and a pipe line hung by vertical supports from a downwardly sloping boom secured to the mast.

Objected to as immaterial.

A. Not to my knowledge. We never gave blue-prints showing such a rig.

Q. 47. Why did you not promote this type of apparatus?

Objected to as immaterial.

A. It was never suggested by the Concrete Appliances Company.

Q. 48. Did any of your customers ever use the apparatus of Sheet 1 of Callahan patent 948,789, which I show you?

Objected to as immaterial.

A. Not to my knowledge. What is this—a lattice boom, or what? (Witness indicates the part X.)

Q. 49. What do these circles represent in the third sheet of the blue-prints Exhibit 41?

Objected to as irrelevant, immaterial and relating to matter not [fol. 476] properly proven and not connected to any party connected with the present cause.

A. They show the radii that can be reached from the tower by the movable boom and swivel pipe therefrom, showing how all the parts that are to be concreted can be reached by the use of this system. It was used also to demonstrate to the customer the rapidity with which concrete could be poured, and the saving in labor over taking to the point of pouring by means of carts or wheelbarrows.

Q. 50. Did you ever rent or sell your customers counterbalanced chutes which were swivelled from the end of a supply chute?

Objected to as immaterial.

A. We never did.

Q. 51. In your work today in connection with metal specialties for concrete buildings, do you ever see carts of the Ransome type used?

A. Yes, frequently.

Q. 52. Was William H. Insley a competitor of yours from 1910 to 1913?

Objected to as immaterial.

A. Not in the use of this system; they were on one or two other lines that we handled.

Q. 53. What was the Insley line at that time?

Objected to as immaterial.

A. They made orange peel and clam shell buckets, carts, somewhat similar to the Ransome. These were the only things on which we came in contact with them. I do not know their full line at that time.

Q. 54. How long have the photographs, Exhibit 43, been in your files?

Objected to as irrelevant and immaterial.

[fol. 477] A. Ever since they were taken in 1911.

Further objected to as subsequent in date to the date of the patent in suit.

Q. 55. Where is Mr. Monstead, of the Monstead Company.

A. I haven't the slightest idea. We have had no dealings with the Monstead Company since 1913.

Direct examination closed.

Cross-examination by Mr. Hood without waiver of objections and without waiver of right to subsequent cross-examination, *as previously noted:*

X Q. 56. Do you know of your own knowledge that the Mr. Emtman, about whom you have testified, was the same man whose name appears on patent 948,723, copy of which was shown you in direct examination?

A. Yes.

X Q. 57. How do you know that?

A. Because we were told that Theodore Emtman, who was in Chicago at that time with Mr. Engstrum, was the Emtman who had taken out some patents.

In view of the last answer, the testimony of the witness attempting to connect the Emtman, known to the witness, with patent 948,723, is objected to as hearsay.

X Q. 59. Did you personally visit the Witherspoon-Englar Texas job, about which you have testified?

A. I did not. I did handle the correspondence, however, myself.

Counsel for plaintiffs moves to strike all portions of this deposition to which objections have been entered, on the grounds set forth in the objections.

Cross-examination closed.

[fol. 478] Redirect examination by Mr. Jones:

R. D. Q. 60. Where did this Mr. Emtman come from prior to the time you say he was with you in Chicago?

A. From Los Angeles.

R. D. Q. 61. About when did he come to you?

A. We saw him first in October of 1910.

R. D. Q. 62. What was the occasion of your meeting?

A. In conjunction with our taking the agency from the Concrete Appliances Company.

R. D. Q. 63. Did he represent himself as their agent in dealing with you?

Objected to as immaterial.

A. He was with Mr. Engstrum at the time, and did not take up anything with regard to the contract. He was the practical man of the outfit.

R. D. Q. 64. Who was Mr. Engstrum?

A. He was an officer in the Concrete Appliances Company.

R. D. Q. 65. What is the G-Y System you referred to?

By Mr. Hood: Objected to as irrelevant and immaterial, relating to occurrences subsequent to the date of the patent in suit, and not connected with any party to the suit, relating to matter not properly proven and not proper redirect.

A. G-Y is the trade-mark which we took out, and under which we advertised and sold licenses for the system above referred to.

Deposition closed.
Signature waived.

[fol. 479] UNITED STATES DISTRICT COURT, EASTERN DISTRICT OF PENNSYLVANIA

In Equity. No. 2067

CONCRETE APPLIANCES COMPANY et al., a Corporation, and WILLIAM M. INSLEY, Plaintiffs,

vs.

JOHN E. GOMERY, JOHN C. SCHWARTZ, et al., Defendants

Continuation of proofs for final hearing on the part of defendants, commencing this 7th day of March, A. D. 1921, at ten (10) o'clock a. m., pursuant to notice and consent of counsel, at the offices of Westervelt & Ball, 522-525 Citizens National Bank Building, 453 South Spring street, Los Angeles, California, before Raymond S. Taylor, notary public.

Present: George P. Barton, Esq., and Everett L. Ball, for defendants. Arthur M. Hood, Esq., and C. E. Fleming, Esq., for plaintiffs.

HUGH W. BRYSON, having appeared at the request of defendants and being duly sworn in the cause in the caption stated and being examined as a witness in behalf of defendants, testifies as follows:

Direct examination by Mr. Barton:

Q. 1. Please state your name, residence and occupation.

A. Hugh W. Bryson; 601 South Kenmore; age 52; contractor; I was manager for F. O. Engstrum Company, contractors, from about 1904 until about 1916.

Q. 2. Were you, during that time, acquainted with Theodore Emt-
[fol. 480] man, and if so, state what connection Mr. Emtman had, if any, with the F. O. Engstrum Company.

A. I was acquainted with Mr. Emtman during the above period. Mr. Emtman was foreman and superintendent on several buildings during the same period.

Q. 3. I show you copy of patent No. 948,723, granted February 8, 1910, to Theodore Emtman, and I call your attention particularly to the figures of the drawing: Figure No. 1 and Figure No. 2. You will note that in those drawings is shown a mast mounted to rotate on a vertical axis.

A. I recognize the mast on rotary mentioned above.

Q. 4. Did you know Mr. Emtman in the year 1906?

A. I did.

Q. 5. You may state if at or about that time he described to you any such apparatus as is shown on the drawing of his patent, which I have shown you.

A. Not at that time he did not. He being a concrete man, why, we talked in a general way many times about that time and afterwards about the feasibility of running concrete by gravity. My first impression of Mr. Emtman's conversation was how to mix, which was a very difficult feature—to keep concrete from rock by flowing by gravity. The conversation now and then continued on that line in general without speaking much of the apparatus.

Q. 6. Did you, as superintendent of the F. O. Engstrum Co., have to do with the concrete construction of the Majestic Theater in Los Angeles?

A. I did.

Q. 7. Do you remember when that was? If so, state.

A. You mean the beginning of the Majestic Theater?

Q. 8. Yes.

A. I think it was in the early part of 1907. I have a record of exactly when they began, if my particular answer does not quite [fol. 481] coincide with established records. I give the above purely from memory without records.

Q. 9. To refresh your recollection I call your attention to a certified copy of the preliminary statement of Mr. Emtman in Interference No. 30,618, involving the application upon which Emtman's patent was issued, and two other then pending applications. You will note that in that sworn statement Mr. Emtman says: "That he commenced the construction of his invention in a full-sized apparatus during the month of November, 1907, and completed it in about the latter part of December, 1907, and that said apparatus was first successfully operated during the latter part of December, 1907, or the early part of January, 1908, in Los Angeles, California." Does that statement accord with your recollection of the matter?

A. He started some buildings about that time. A great many angles in connection with gravity system, which to construct, it is necessary to begin from mixer, tower, hopper pipe and the boom. About those dates he perhaps set up a mixer and a tower on the Majestic Theater, which was part of a gravity system, to run in the basement; after the basement was placed by the wheelbarrow and cart method he raised the tower to place the concrete on the first floors or walls, or rather the walls and then the floor, which was about the 1st or 15th of December, 1907, using the wheelbarrow method up to that point. He, in connection with others of the men working on the building, including myself, talked about delivering concrete by gravity. Mr. Emtman was busy on other jobs and we followed up the development of the gravity system with Lee Callahan and others, and right there I might state that Mr. Callahan, one of our carpenter foremen, explained that he had given much thought and study to the delivering of concrete by

[fol. 482] gravity. From then on we worked in harmony to develop a gravity system for delivering concrete by gravity on the Majestic Theater. Mr. Emtman was perhaps on other jobs. However, he was subject at all times to consultation and he had instructions to develop the gravity system according to his own ideas the best he could. Mr. Callahan had the same instructions. These patents of Mr. Emtman's were applied for some time thereafter, where he had perfected a gravity system on those lines on those dates on other jobs principally the Elks Hall, Luckenbach Building and Christian Science Church, which followed simultaneously construction as the Majestic Theater proceeded. Otherwise we put him on one job, another fellow on another job and another fellow on another job.

Q. 10. I understand then that your recollection corresponds substantially with the statement of facts as sworn to by Mr. Emtman. Is this correct?

A. Well, if this is intended to say that this full system was developed at those dates why it was not intended that way. There was a lot of talking during the years Mr. Emtman has mentioned here from the different angles that is necessary to make the gravity system. One of the principal drawbacks from an engineer's standpoint was the mix of concrete to flow by gravity. The mix of concrete to flow by gravity was different than any engineers had tried before. The question in everybody's mind was whether the rock would separate from the cement or gravel, and many a conversation was had on the lines of getting a mix irrespective of apparatus, or whether it would flow by gravity or not.

Q. 11. Would you say then that the problem to be solved was as to whether the sand, the gravel, cement and water would mix when sent down by gravity rather than the problem as to the means of doing it?

[fol. 483] By Mr. Hood: The question is objected to as leading and an attempt to put desired words into the mouth of the witness.

A. The feature, so far as the mix was concerned, that was part of the whole for successful operation, and a great many authorities differed on whether it was practical or not. However, from a theoretical standpoint it seemed to pass approval. It had been experimented with several times by our organization in a limited way—as far as the mix was concerned.

Q. 12. I do not know that it appears yet upon the record, so I wish you would state your relations to the plaintiff in this suit.

A. You mean F. O. Engstrum Co.?

Q. 12a. No the Concrete Appliances Company.

A. I am a stockholder of the Concrete Appliances Co. Up to several years ago was president of same. It is a California corporation. In my official capacity I closed a contract with W. H. Insley of Indianapolis, to represent and put on the market what has since developed and is now known as the "G-Y Gravity System."

Q. 13. Prior to January, 1908, do you recall talking with Emt-

man or anyone else as to the apparatus that should be used in handling cement or mush by the gravity system?

A. Yes, previous to that time we had many conversations to develop the different angles as to what would afterwards develop gravity system. Gravity system consists of a great many old established principles, such as mixer, tower, skip, all of which had been previously used and discussed, but on account of the enormous expense of delivery of concrete we used those things above mentioned, together with labor and the cart and wheelbarrow method worked, [fol. 484] all considerably with the view of economical distribution, and in general conversations if we could eliminate a good deal of the labor which was necessary by the cart and wheelbarrow method and get the concrete to different points of the building and save a good deal of tamping, which is costly. It was an idea that a great many authorities had talked over and tried to perfect, with the view of getting a gravity system that was both practical from a delivery material standpoint and economical as to operations which after developed in stages to get up to the time the patents were applied for on several large reinforced concrete buildings.

Q. 14. Mr. Bryson, I don't think your answer is quite responsive to my question. I ask the reporter to read it to you and ask you to answer it if you can, just as it is put.

(Question read to witness.)

A. I explained to you gravity system was finally developed into what is known as gravity system, but had to take certain stages to get what is now known as gravity system and which is now perfected as gravity system. Gravity system was unknown at that particular time in its entirety.

Q. 15. My previous question would seem to call for a direct answer—that is "yes" or "no," with any explanations you might wish to make. I will repeat it.

(Question repeated to witness.)

A. Gravity system was not in existence at that time; therefore I could not tell what developed afterwards. Only some parts of it—that is now the gravity system, that we talked about.

Q. 16. I think my previous question calls properly for a "yes" or "no" answer. Can you give such an answer—"yes" or "no"? If so, please do it.

[fol. 485] By Mr. Hood: The witness is advised that it is not necessary for him to answer any question "yes" or "no" if he desires to make any explanation. He may answer the question in his own words and in his own manner.

(Question read again to witness.)

A. Well I want to answer with explanations. What is now part of the gravity system—perhaps the mixer, tower—and the feasibility of mixing concrete and running same by a pipe or a chute was discussed previous to January, 1908. The other parts of the

gravity system, such as the boom, swivel and the construction that would give us a vertical movement over a large radius was discussed with the possibility of making and completing a whole gravity system.

Q. 17. All prior to January, 1908?

A. Yes.

Q. 19. Now the fact appears that Mr. Emtman was working with you or for you at that time, and did you discuss all these things with Mr. Emtman at that time?

A. Yes, we had many conversations about that period. We had conversations about many other things.

Q. 19. And you had conversations with him about the rotating mast of his patent?

A. I don't remember that particular detail. That was not in the early stages. That developed a little while afterwards.

Q. 20. And did Mr. Emtman ever practically use on any of your work that rotating mast?

A. Yes.

Q. 21. And did he talk to you about any other way of rotating or moving the delivery pipe or pipes or chutes except by a rotary machine at any time?

A. Well, it was after that that he developed the rotary mast and perfected it. During those dates or about January, 1908, or a little [fol. 486] bit previous to that the basis of conversation was more on the construction—it was not the apparatus, realizing that a certain mix had to be secured in the event that the apparatus was finally developed and right after those dates and continuously, why Mr. Emtman was on different reinforced concrete jobs—the buildings he was foreman and superintendent on, on which he perfected a mast with a rotary movement.

Q. 22. I ask you more particularly about the rotary mast—do you remember that that specific device was used by Emtman at any time, and if so, when first?

A. As I previously explained, he was one of our superintendents and foremen and he was consulted from time to time about what afterwards developed into the gravity system, and previous to January, 1908, there was none in existence by Mr. Emtman from a practical standpoint.

Q. 23. But he talked about it with you prior to January, 1908?

A. Well, he might have—I don't remember that exactly, but we talked about the gravity system or what later developed into the gravity system in general as we came to the different necessary features to perfect it as a whole.

Q. 24. Was the rotatable mast used in connection with the cement work of the Majestic Theater?

A. Well you might term it that. It was a boom. Part of it was a boom; afterwards it developed into a more perfected boom. My recollection was a stick about 20 or 25 feet long that was so constructed that it could vertically move with the pipe quite a degree away from the tower swinging movement and the pipe was hung from a guy wire from tower, which gave it that oscillating move-

[fol. 487] ment. A very crude method of what has now developed into the gravity system and particular feature of it was developed by Mr. Callahan on that particular job. That is, it was under his supervision. He was under the working foreman on a job. It was explained to me he had had some previous experience on gravity system and was allowed to put one up there. That was in 1907 about the latter part and the first part of January, 1908, and it was continuously used and improved as we went along. We first started with a 4-inch pipe and they found that clogged; then we got a 6-inch and found that clogged; then we got an 8-inch pipe all with this little boom or pole or little arm and pipe suspended from tower by cable and swivels so as to get an oscillating vertical movement. That was very crude compared with drawings that came after, so far as a whole gravity system was concerned, which had to be developed from different angles, so we could use it from a practical standpoint.

Q. 25. Do you wish to be understood as saying that the mast was installed at the Majestic Theater prior to January, 1908?

A. It might have been the latter part of December, 1907, or it might have been the first of January, 1908—along about that time.

Q. 26. And did you talk with Mr. Emtman about it?

A. Oh, no doubt, about it in a general way. He was one of the men on our pay rolls.

Q. 27. Well, now did you or did you not?

A. I did, yes. I don't know about the mast—I don't remember about that especially, but this point of gravity system had to be developed and was one of the last parts to be developed.

Q. 28. Now, I wish you would state all that you remember of having said to anyone prior to the first of January, 1908, about the rotating mast.

[fol. 488] A. I don't remember those details. I talked to Emtman—I talked to Callahan and I talked to Fred Engstrum—talked to most anybody that I thought would be apt to be interested, from our standpoint, and did not have any one development on my mind at that time, and only took each angle up as they were developed and come to some decision. I am not a practical man myself and depended on developments from fellows like Callahan, Emtman, or anybody else that worked for us, and had given them permission to go ahead so far as expending any money was concerned. I might say this to you, that anyone that was on our payroll, before expending a dollar of our money, must have the approval by one of the officers. In this particular instance, the man on the Majestic Theater, or any other job, were under my immediate supervision.

Q. 29. And whatever development was made in apparatus, boom or masts or otherwise were made with your approval, were they not?

A. Yes.

Q. 30. And the F. O. Engstrum Co. paid for it?

A. Yes, sir.

Q. 31. And generally speaking you did not care what man did it so it was only done?

A. You are mistaken about that. I was very particular how my

money was spent and analyzed as near as I could any new developments as far as the theoretical or practical part of it was concerned, before I allowed any money to be spent. There was talk of delivering concrete by gravity and it looked to me like it was feasible and naturally I consulted authorities as best I could to see where the defects were and where the advantages were to see if we could not make a practical apparatus, all of which developed.

Q. 32. It was developed then and paid for by the F. O. Engstrum Co.?

[fol. 489] A. By the F. O. Engstrum Co. Partly developed on that job—the boom and pipes and this vertical movement to the side and extended over quite a vast area in a crude way. That particular angle was developed on the Majestic Theater job. It was perfected on the Elks Hall, Christian Science Church and the Union League Building.

Q. 33. You speak of distributing the cement over a considerable area. Did you do that by gravity prior to January, 1908?

A. It was about that time—the latter part of December, 1907, or the first of January, 1908, that we began distributing—was followed up during the life of the building.

Q. 34. Now, while I think I put this question once before, I will ask you specifically whether the distribution by gravity in any way—new or old—was done on that job prior to January 1, 1908?

A. Well, the foundations might have been poured, partly by gravity by putting a chute under the mixer; that is, below the mixer; now that is gravity, but the gravity system is different from gravity. It is a combination of putting ideas together as building goes up and distributing concrete above the mixer after it is hoisted and deposit into chute and spread over area by swivel, and by a horizontal movement, which was not done previous to December, 1907, or the first of January, 1908, by the vertical movement. It might have been put in by gravity in the basement, but when it comes to using the boom and the swivel and the pipe suspended from the tower, that has a vertical movement above the mixer, that is, the first place we used it—on the Majestic Theater—that is gravity system also.

Q. 35. Well, you think that was prior to January, 1908?

[fol. 490] A. It was about the last of December, 1907, or the early part of January, 1908. It is established by documentary evidence, but I think my testimony, as far as dates is concerned, is correct.

Direct examination closed.

Cross-examination by Mr. Hood:

X Q. 36. Mr. Bryson, when did you first meet Lee Callahan, whom you have mentioned?

By Mr. Barton: I call attention to the fact that the direct examination was confined to questions relating to the development of Theodore Emtman's invention. That whatever was said about Lee Callahan was volunteered and that the testimony now relating

to Lee Callahan called for by the question should be considered as direct testimony for the plaintiffs.

By Mr. Hood: Attention is called to the fact that the direct examination was not as limited as has been stated by counsel for the defendants, and attention is called particularly to question No. 13, in which the witness was asked as to whether prior to January, 1908, he had talked with others.

A. About the middle of December, 1907.

X Q. 37. Prior to January 1st, 1908, had you talked with Lee Callahan relative to the distribution of a mush concrete by any special apparatus?

A. I had.

X Q. 38. Under what circumstances did you first meet Lee Callahan?

A. He applied to me for a job. After analyzing his qualifications in which he explained he was a first-class mechanic, had had a good deal of experience on concrete work and had been in business for himself and was a carpenter by trade and a general all around [fol. 491] foreman, we needed such qualifications as he said that he had and at that time we were working on several buildings, and among them was the Majestic Theater on South Broadway, which had been started some time previous. After analyzing Mr. Callahan's qualifications I decided that he would be the man that we would be glad to have on our pay roll and gave him a chance.

X Q. 39. In referring to the Majestic Theater, do you mean the Majestic Theater in Los Angeles?

A. I do.

X Q. 40. Do you recall about when this conversation with Mr. Callahan took place?

A. About the middle of December, 1907.

X Q. 41. Had you ever seen Mr. Callahan before that time?

A. I had not.

X Q. 42. What was the condition of the work at the Majestic Theater building site at the time you first met Mr. Callahan?

A. Well, the foundations were in, being a reinforced concrete biulding; part of the framework was in and in the front part of the building some of the concrete was placed in the framework and above that there was the frame or carpenter work in and perhaps the steel was set in that frame work ready for the placing of the concrete.

X Q. 43. By framework do you mean the forms for the reception of the concrete?

A. Yes.

X Q. 44. As I understood it, this building did not have any steel frame work.

A. No.

X Q. 45. Do you recall about how high the form work was up at the time Mr. Callahan came to you?

A. Going toward the second floor in front.

[fol. 492] X Q. 46. What kind of a first floor did that building have or was it intended to have?

A. Reinforced concrete floor, balcony effect.

X Q. 47. Was it all to be on the level with the street?

A. No, the construction of the building calls for offices fronting on Broadway Street and in the rear, why, it has a dome effect, with balconies in a regular theater form and shape.

X Q. 48. Then going into the building on the street level there was to be a floor on a level with the street part way back and then a sort of an inclined step amphitheater arrangement descending toward the basement?

A. Yes, and toward the stage.

X Q. 49. Was that inclined construction concrete in place at the time Mr. Callahan came?

A. No, perhaps some of the form work. Was just beginning on that particular part of the building.

X Q. 50. Do you recall Mr. Callahan's statements to you in stating his qualifications as to their general character?

A. He explained to me that he was a carpenter foreman—that he had had many years of experience on framework, brick work and concrete work, and had had experience in handling a great many men under different plans and specifications, and that he had given a great deal of thought to the construction of concrete, all of which qualifications were in line with that particular building, and his qualifications appealed to me very strongly.

X Q. 51. What was there in his statement of qualifications which particularly appealed to you as indicating that he was probably a man that would be profitable for you to employ?

A. Well, it was several of his qualifications—his having had [fol. 493] previous experience in handling men, and having worked on reinforced concrete buildings especially appealed to me. He explained in detail several jobs that he had been on where he had placed the concrete, and at that time we were increasing our organization as fast as we could get the men, and any man that would be apt to have such qualifications would be considered for a job. He also appealed to me as a good assistant foreman. Concrete was very much in its infancy, generally speaking, at that time and when I could find a good man who had had previous experience on concrete I was very much interested in him. Other qualifications that were mentioned were that he had some thoughts of chuting concrete, all of which he explained in general detail and was very interesting, as far as coming to a conclusion as to his qualifications as to putting him on a job in charge of a gang of men.

X Q. 52. What did Mr. Callahan tell you at that time and preliminary to your employment of him relative to his ideas about chuting concrete?

A. Said he had given the subject a great deal of thought and had gone through some of the angles of the experimental features, and being a very large concrete building would like to have the opportunity of inaugurating the system he had had in mind.

X Q. 53. Did he describe that system or apparatus?

A. In a general way—said it was all in the mix and talked

considerably at length how to mix. At that particular time I had not quite satisfied myself that it was practical, and he explained that with the tower we were then using and the skip we could deliver the concrete by gravity and chute and pipe and went on to explain to me in a general way about the chute system, which was very appealing to me, and he went into a few details as to how, all of which met my approval.

[fol. 494] X Q. 54. Suppose you tell us as nearly as you can in the words of Mr. Callahan just what sort of an apparatus he proposed to use for the purpose of chuting the concrete.

A. Well, he explained that he would run some concrete, as far as the mix was concerned, in the basement where rock would not separate, and he was very positive about hoisting it—sending it down through a pipe it would not separate, so I told him to go ahead and ordered the pipe for him and anything else he wanted to let the different departments know so he could get a system according to his ideas, which he said would take a pipe and the pipe would be held up by trestles all swung from the boom—one from the tower which would hold it up; explained a half dozen different ways as far as holding the pipe in the air was concerned, and he said he could put an arm to help suspend the pipe and he said he also thought the pipe could be moved, by his explanation of suspending from the tower, by guy wires and an arm.

X Q. 55. How was this arm or boom to be supported?

A. To be supported on a tower.

X Q. 56. And how was it to be supported on the tower?

A. Well, so that it would revolve or give a vertical motion so as to get over an area of floor space—part of getting to a perfecting system.

X Q. 57. What sort of a connection was there to be between the tower or boom or arm?

A. He drew a little diagram of some kind where you could hook the boom into the tower so that it would vertically operate—not being a mechanic I don't remember the exact details of it, only that I saw very plainly it looked to me like he knew what he was talking about, and after I put him to work one of the first instructions I gave him was to go and try out his scheme and see how it would work out from a practical standpoint.

[fol. 495] X Q. 58. How did he propose to get the concrete up to this pipe?

A. Well, that was already in existence where we had a mixer and a tower and a hoist already on the job and his development came from the tower on out. We had previously used that with a wheelbarrow and cart method to do some parts of the job.

X Q. 59. What became of the concrete in the hoist when it was raised in the tower?

A. It was dumped into a hopper and from the hopper Callahan developed a kind of a crude pan effect where he had kind of a nail in the center of it where it would revolve around and on that he hung some 4-inch pipe and the pipe was supported by wire from the tower. A day or so after that he put an arm to help

to hold up the pipe which revolved around with the pipe when you went to swing it from right to left.

X Q. 60. Did he describe this sort of construction before you hired him?

A. In a general way.

X Q. 61. Now prior to your meeting with Mr. Callahan about the middle of December, 1907, had Mr. Emtman ever described an apparatus of this kind, which was to include a swinging arm and chute pipe suspended from the tower?

A. No.

X Q. 62. You hired Mr. Callahan then after he had told you about what he thought he could do?

A. Yes.

X Q. 63. About when was that that you hired him?

A. Some time right close to the middle of December—right after the middle of December, 1907.

X Q. 64. And when did Mr. Callahan go to work for you?

A. The day after Christmas in 1907.

[fol. 496] X Q. 65. What did Mr. Callahan do then?

A. I put him in charge of certain form work which was previously described with a great many men under him. Told him to get busy on perfecting his system of delivering concrete, which he did immediately thereafter.

X Q. 66. Suppose you describe the complete apparatus that Callahan built.

A. Right at the beginning or that he made use of on this Majestic Theater job?

X Q. 67. That was used on the Majestic Theater.

A. He made use of a mixer, a tower, a skip, a hopper. Leading from the hopper was kind of an ill-shaped pan effect—from my recollection 4 inches deep, with a hole in the middle where he put a nail or screw of some kind so as to give it a vertical motion; from that he had a 4-inch pipe supported to the tower and his hopper and pan, as described, was also supported on the tower and the pipe was held up by a ½-inch wire rope or cable.

X Q. 68. Where was this wire rope or cable fastened?

A. Fastened on top of tower or somewhere near it.

X Q. 69. What do you mean by vertical motion of the pan?

A. I used vertical when I meant horizontal—it was a swinging motion I am trying to describe from side to side.

X Q. 70. Was there anything in the hopper or in connection with the hopper to make it possible to control the flow of concrete from the hopper to this pan?

A. Yes, a small gate, and it was possible to dump the hopper full of concrete and have a gate that let it out as it was needed at the other end of the pipe and controlled by a man in the tower.

X Q. 71. Was this pipe that led from the pan in one piece or what was it?

[fol. 497] A. Started in one piece, added pieces to it with a shovel as the work progressed.

X Q. 72. What was the condition of the work at the Majestic Theater building at the time this special apparatus was first completed and ready to handle concrete?

A. Well, the foundation was in all around the building. The first floor from the Broadway side—I mean the first walls—was poured and also placed—rather in concrete, and the framework on the Broadway side was going up toward the second and including the second story, as far as the front of the building was concerned. The rear building began on framework and took up to the next stopping point—from a carpenter's standpoint—when this idea was first started the steel was placed in those forms which I have mentioned and that was where the pouring began.

X Q. 73. Was concrete poured?

A. It was poured at that time.

X Q. 74. How did the apparatus work?

A. Had a great deal of difficulty. The pipe was too small and would get clogged and then we knew when we tried it we did not quite understand how to work it out and had to take the pipe down and knock the clog out and put it back again, and came to the conclusion the pipe was too small and got another pipe. The next thing we tried a 6-inch pipe on the same principles that we tried the 4-inch pipe. That worked considerably better; however, there was some clogs and finally, after a few days, we got an 8-inch pipe and we found the 8-inch pipe had less clogs, and, therefore, more economical in construction than either the 4-inch or 6-inch pipe.

X Q. 75. Now I understood you to say at the beginning the first section of pipe leading from the pan under the hopper was supported at its outer lower end by means of a cable which led back [fol. 498] to a higher point on the tower; is that right?

A. Yes.

X Q. 76. Did that apparatus work successfully so far as swinging the pipe from side to side was concerned?

A. It did.

X Q. 77. And did the concrete flow from the hopper into the pan and from the pan into the pipe no matter what the angular position of the pipe was?

A. It was and it did.

X Q. 78. About how soon did Mr. Callahan put up this supporting arm or boom you talked about?

A. About four or five days after he first put up the pipe.

X Q. 79. Well, how was that secured on the tower?

A. It was secured on the tower with perhaps a block—I am not mechanic enough to explain exactly the details of how the arm was secured on the tower, but it was so constructed that it would move horizontally.

X Q. 80. You mean swing from side to side?

A. I mean swing from side to side.

X Q. 81. How was this arm or boom supported at its outer end?

A. Tied to the pipe by a wire following the pipe movement wherever it might be vertically moved.

X Q. 82. Was this arm above or below the pipe?
A. Below the pipe.
X Q. 83. And inclined upwardly and outwardly so as to connect with the pipe?
A. Yes.
X Q. 84. Sort of a brace that would swing with the pipe?
A. Yes.
X Q. 85. Well after that arm or boom was put in place, was the apparatus used then?
[fol. 499] A. It was continuously used from that on and improved as fast as we could improve it as to the delivery of concrete, but it had to be joined by other pipe on swivels so as to deliver the concrete to different parts of the building.
X Q. 86. At the time this boom was put in place and into use, had the height of the building progressed beyond the level of the second floor?
A. I think it had. I am not positive on that particular point, but I remember them putting it in a few days after he fastened the pipe to the tower.
X Q. 87. When they first started the use of this special apparatus, about how high up from the ground was the hopper?
A. I judge about 30, 35 or 40 feet.
X Q. 88. When the work had progressed to a point approximating the second floor, what was done with the apparatus then?
A. Why the tower was raised and the guides for the skip were raised with it and the whole apparatus—that is, the pipes—were raised consistent with the next floor; they wanted to pour concrete after raising of it all.
X Q. 89. What became of the hopper?
A. The hopper had to be raised—otherwise could not have poured.
X Q. 90. How about the boom?
A. It would simultaneously go up with the tower making the necessary connections and continued on those lines as needed during the construction of the building.
X Q. 91. How high a building?
A. Eight stories and basement.
X Q. 92. And was this special apparatus used throughout the construction of the building from the time of its first operation until its completion of the concreting of the builidng?
[fol. 500] A. It was continuously used on that building from then on only in an improved state as far as delivery of the concrete was concerned and more perfected in its system.
X Q. 93. From the time the boom was installed until the end of the operations, was that boom kept in place with the chute and tower and raised from time to time?
A. From time to time and whenever it was needed. We always kept that as a fundamental part of gravity system. However, though, you know that a boom was a stick that afterwards developed into a boom 20 or 25 feet long.
X Q. 94. That building is still standing, isn't it?
A. It is.

X Q. 95. The concrete work has passed satisfactory inspection and the building was accepted by the city?

A. By the city, architect, engineer, owner and contractors.

X Q. 96. Before that apparatus was installed by Mr. Callahan, what did you have to do with the concrete after you had carried it to any particular point with the wheelbarrow?

A. The system then generally established was to make your forms and place the concrete in those forms to be dumped from a hopper into wheelbarrows and carted around after putting planks all over the building so that a wheelbarrow could reach a given point, and it was customary in Los Angeles and this vicinity to use Mexican laborers to roll the wheelbarrows—take and get a wheelbarrow from a hopper and roll it to a given point under the illustration of foreman and dump it wherever it was dumped; it was customary to have a lot of men tamp so as to give a homogeneous mass.

X Q. 97. After this special apparatus of Callahan's was installed, did you have to tamp the concrete?

[fol. 501] A. Not very much, eliminated 90 per cent. of expense in tamping.

X Q. 98. Your attention has been called to a certain patent No. 948,723, issued on the application of Theodore Emtman. Your particular attention has been called in direct examination to the mast No. 16, which is pivotally mounted on top of the tower. Had Mr. Emtman ever described to you such an apparatus, including this tower or any other means for supporting and swinging a chute from the tower prior to the time Mr. Callahan came to you in the middle of December, 1907?

A. He had not.

X Q. 98a. Did Mr. Emtman ever describe such an apparatus prior to the time the Callahan apparatus had been built and put into use at the Majestic Theater building early in January, 1908?

A. No.

X Q. 99. Do you recall approximately the time when this Callahan apparatus was first used to pour concrete on the Majestic Theater job?

A. The latter part of December, 1907, or the first part of January, 1908.

X Q. 100. That is, within a few days after Callahan went to work on December 26, 1907?

A. Almost immediately. That particular time the tower, skip and mixer was there—simply a question of adding to the tower a kind of a pipe and seeing that the right kind of mix went through the pipe.

X Q. 101. By the way, where was the mixer?

A. Mixer was about the middle of building south side of Majestic Theater.

X Q. 102. Was it at the ground level—above or below the ground level?

A. In the ground a little bit.

X Q. 103. At the foot of the tower?

[fol. 502] A. Yes.

X Q. 104. Did Callahan stay in the employ of the F. O. Engstrum Co. during this entire operation on the Majestic job?

A. No, he did not, he was continuously with us on the Majestic Theater for about six months, possibly seven. Then we took him off and put him in charge of another job we had gotten in San Diego.

X Q. 105. Was this a reinforced concrete job?

A. It was. It was known as the Timken Building.

X Q. 106. Did he use any special apparatus down there?

A. Yes, he used gravity system in a more completed state on that job right from the beginning.

X Q. 107. And did that Timken job have a tower and a hopper?

A. A tower, hopper, mixer, pan, chute, pipe and what might be termed an arm or boom.

X Q. 108. And how was that arm or boom supported?

A. Supported on the tower just like the other. Pipe was supported on tower by cable.

X Q. 109. And how was the chute supported?

A. On the tower.

X Q. 110. And was it connected with the boom in any way?

A. Yes, it was. I think it had the boom in this particular instance; in fact, I almost know it was the boom which was above the pipe and the pipe was suspended from the tower and the boom both, but they both had the vertical motion—I mean the horizontal motion.

X Q. 111. You mean it had a swinging motion from side to side?

A. Swinging motion from left to right and covered a given area.

X Q. 112. And was that apparatus used throughout the entire [fol. 503] construction operation of this Timken Building?

A. Yes.

X Q. 113. Now do you recall about when it was, if after that, that Emtman described to you the special apparatus shown in his patent in which there was to be this pivotal mast mounted at the top of the tower?

A. I think it was on the Elks Hall, which is on Third and Clay Streets, Los Angeles, or perhaps the Luckenbach Building, which is on South Hill Street, below Third, Los Angeles, or it might have possibly been the Union League Building, which is on Second and Hill Streets, Los Angeles, all of which are reinforced concrete buildings, and on which Emtman was the foreman.

X Q. 114. When were these three buildings under process of construction?

A. I think the latter part of 1908, 1909 and 1910.

X Q. 115. And Emtman actually made an apparatus like that shown in patent and used it on one of those buildings?

A. Fundamentally.

X Q. 116. Now that mast had to be supported at its upper ends by guy lines, which were led off to some exterior points away from the tower?

A. Yes.

X Q. 117. It required quite a bit of ground boom?

A. It did and quite a good deal of cable.

X Q. 118. How long did Callahan stay in the employ of the F. O. Engstrum Co. approximately?

A. Eight or ten years.

X Q. 119. During that time, did he make use of the apparatus as you have described and similar to the Majestic Theater job and Timken Building apparatus, on other buildings?

A. Yes, the same system was used on all concrete buildings of any [fol. 504] magnitude that we got contracts for in the future, and anyone that Callahan was on he would try to improve his system as much as he could and any of those Emtman was on he would try to improve his system as much as he could, working from two different angles.

X Q. 120. Then in those devices that were used on the buildings Callahan worked on, did they continue to have this swinging pipe and a swinging boom that assisted in supporting the outer end of first pipe section?

A. It did continuously.

X Q. 121. Did this device operate satisfactorily?

A. Absolutely. Very economical in operation. Cut the cost down 300 or 400 per cent., as far as delivering the concrete was concerned.

X Q. 122. Prior to the time you say Callahan told you about his ideas and about the middle of December, 1907, had anybody else ever described to you an apparatus which was to handle mush concrete and which was to comprise a tower, a hoist bucket or skip or boom, a mixer at base of tower to deliver concrete into bucket, a hopper mounted at an elevated point on the tower and provided with a control gate and arranged so it could be raised from time to time as the building progressed; a horizontal boom mounted on the tower in such a way that it could be raised from time to time as the building progressed and a chute section supported by the boom and so connected to the hopper that the boom and chute could be swung from side to side and yet the hopper would at all times deliver concrete to the chute?

A. No one had.

X Q. 123. Now in these various Callahan devices which were used, were the hopper and boom and chute raised from time to time as the building progressed?

A. It was.

[fol. 505] X Q. 124. About how many reinforced concrete buildings were erected with the assistance of this Callahan apparatus—say during the period from the time of the Majestic Theater building until, say, through 1911?

A. In this vicinity?

X Q. 125. Yes.

A. Well, he went from the Majestic Theater Building in August, 1908, to the Timken Building in San Diego, which was a large reinforced concrete office building, and after that Callahan went to the Marston Building in San Diego, which is a large reinforced department store building and after that I think he came back here

and we put him on a reinforced concrete building known as the engine house down on Winston Street. There may be one or two other buildings of similar construction he was on that I don't recall now in that particular period, but we recognized him and he proved a first class reinforced concrete foreman, and we put him on concrete buildings where we had him available.

X Q. 126. And during that same period, about how many buildings were erected with the assistance of an apparatus like that shown in the Emtman patent, where a mast and connected boom were pivotally mounted at the top of tower and the mast was supported at its upper end leading off by guy wires to its exterior supports?

A. I recall the Elks Hall, 3rd and Clay Streets, Los Angeles; the Luckenback Building, Hill Street, north of Third, Los Angeles; Christian Science Church, Pasadena. Those are the jobs Mr. Emtman was on. We had other foremen at that time on other concrete jobs using practically the same system, as far as the skip, tower, hopper, boom and the pipe swinging vertically was concerned. Kubach & Co. used a system of that kind on the car barns for the Los Angeles [fol. 506] Railway Co., Pre-Cooling Plant at San Bernardino; also one at Colton for the account of the Santa Fe Road, and a number of other smaller jubs about that time.

X Q. 127. During the years 1908, '09, '10 and 1911 about how many buildings were erected under the authorization of your Company, in which there was used a tower, overhead bucket vertically adjusted hopper, vertically adjusted boom—and by vertically adjustable I mean capable of being shifted on the tower from time to time to new positions as the work progressed—and the chute supported by the boom and connected with the hopper in such a way as to receive the concrete from the hopper no matter what position the chute might occupy in connection with its possible swinging from side to side?

A. How many buildings, you want to know?

X Q. 128. Yes.

A. I would have to go to some records to get that—could get it, I presume. I know of five of ten millons' worth, as far as value is concerned; as far as number, besides those previously mentioned, there were many others; in fact I have concrete buildings that contained only 200 or 300 yards; we used the gravity system on them from the beginning of the Majestic Theater operations.

X Q. 129. Most of the buildings were buildings of a good many stories in height and considerable ground area, were they not?

A. Yes, the largest buildings in Southern California—the Engstrum Apartments, about 8 or 10 stories reinforced concrete; the Rex-Arms, about 9 or 10 stories reinforced concrete; the Rampart Apartments; the Bryson, 10 stories reinforced concrete; Citizens Bank and Trust Co., 8 stories reinforced concrete, Pasadena; Citizens National Bank Building (which is this building); Clarke [fol. 507] Hotel—at least 75 or 100 of them could be established if I could go to my records.

X Q. 130. In connection with all of those buildings that you have mentioned, did they use an apparatus, which included the swinging

boom supporting the chute where the boom was pivoted on the tower, or did they use in connection with some of those buildings the Emtman type, where the swinging boom was carried by the pivoted mast, which was mounted on top of the tower and guided by guy lines to exterior supports?

A. Some of the buildings were constructed under one system and some under another as far as separating the two systems is concerned. All those buildings Emtman was on as a superintendent or foreman were practically using his system. Those Callahan was on used practically his system.

X Q. 131. About how many buildings did Emtman directly superintend?

A. 40 or 50—maybe 60 or 70—a great many of them—that is, large buildings.

X Q. 132. Do you mean by that out of the 75 the Emtman type of construction was used on 60 or 70 and only the remaining 15 or 5 utilized the Callahan type of structure?

A. I think it was a little bit greater proportion than that—about two-thirds of Emtman's system and about one-third of the Callahan system—that is, after both systems were perfected.

X Q. 133. Now, was Emtman in direct and immediate charge of the building operations at the Majestic Theater, or was Callahan?

A. Mr. Emtman was in charge directly of it. He was a man we used as a general utility man, a man we consulted frequently on mechanical operations and our plan was to keep him as free as we [fol. 508] could from any one particular job; except where necessary to put him on a job we were organized to such an extent that we could call him off that job if needed. Mr. Callahan might be termed a sub-foreman on the job; he had other foremen over him.

X Q. 134. Did Mr. Callahan work directly under your orders?

A. Worked according to plans and specifications as far as the construction of the building was concerned, and anything needed in the way of material or men or the general supervision of the business outside of the mechanical part of it, he was under my direct orders.

X Q. 135. This special apparatus which you say he produced was produced by him under your direct permission?

A. I gave him permission to do it.

X Q. 136. And Mr. Emtman on his jobs which he directly superintended produced his special apparatus under your permission?

A. Yes.

X Q. 137. How often were you on the Majestic Theater job?

A. Practically every day—part of the time every day.

X Q. 138. And you visited all these other various jobs you mentioned from time to time, did you?

A. Nearly every day. I made it a point to go to every job every day, check up the men, see that material was there and give any general instructions which might be out of the line of the fundamental construction, that any foreman might have when he first took hold of the job.

Cross-examination closed.

[fol. 509] Redirect examination by Mr. Barton:

R. D. Q. 139. When did your company first consider securing patent protection upon the Emtman-Callahan and the Smith devices?

By Mr. Hood: Objected to as irrelevant and immaterial.

A. Don't remember the exact dates. Emtman and Callahan were on the pay roll and Callahan's and Emtman's ideas were developed at our expense and we organized a Concrete Appliance Co. to take over these patents after they were granted.

R. D. Q. 140. When first did you consider that question?

By Mr. Hood: Objected to as irrelevant and immaterial.

A. I don't remember the dates.

R. D. Q. 141. It appears that all the three applications were filed in the Patent Office early in the year 1909. How long prior to January, 1909, do you recall speaking with either one of the gentlemen about their applying for patents and assigning the patents when procured to your company?

By Mr. Hood: Objected to as irrelevant and immaterial.

A. Emtman's patent was applied for through Lyon & Hackley, patent attorneys of Los Angeles, and I paid the necessary fees and attorney's fees at the time. Callahan's patent was afterwards purchased from Mr. Callahan for a consideration, but with it he recognized our right to it on account of developing it on our jobs and in co-operation with his ideas, and we secured by purchase Mr. Callahan's patents.

R. D. Q. 142. More than one patent on this structure?

[fol. 510] By Mr. Hood: Objected to as irrelevant and immaterial.

A. I don't think there was but one patent.

R. D. Q. 143. You mean of Mr. Callahan?

A. Yes.

R. D. Q. 144. Did you ever know of Callahan making any other invention than this?

By Mr. Hood: Objected to as irrelevant and immaterial.

A. Yes, he made one or two other inventions.

R. D. Q. 145. In this line?

A. Something to do with concrete construction. I don't know just what they were, but know he had one or two patents.

R. D. Q. 146. State, if you are willing, how much you paid Callahan for this.

By Mr. Hood: Objected to as irrelevant and immaterial. The witness is instructed that he need not answer unless he so desires.

R. D. Q. 147. Is Callahan financially interested in your Company now?

A. He is not.
R. D. Q. 148. Was he ever?
A. No, not since the purchase of the patents.
R. D. Q. 149. Did you agree with Emtman or with Callahan that they should assign any inventions they made to you at any time prior to January, 1909?
A. No, we did not have any understanding with them. Just simply took what was in evidence; that is, as a basis for Concrete Appliances Co. I presume your record shows Callahan and Emtman and Mr. Smith got into an interference.

[fol. 511] Recross-examination by Mr. Hood:

R. X. Q. 150. Did Mr. Callahan ever have any financial interest or stock holding interest in the Concrete Appliances Co.?
A. He did not.

Met pursuant to agreement at 2 o'clock p. m.
Same counsel present.

Further examination of the witness Bryson by Mr. Barton:

R. D. Q. 151. Were photographs taken of the work at the Majestic Theater as the work progressed?
A. No, not in its entirety. I have a few photographs taken of the building and some parts of the operation of pouring the concrete.
R. D. Q. 152. Are you willing to produce them? If so, please do so.

The witness here produced four photographs and hands them to counsel for defendants. The four photographs are offered in evidence and the photographs of the Majestic Theater Building job are marked Defendant's Exhibits 44-A, 44-B, 44-C and 44-D.

R. D. Q. 153. Do you know the dates when these photographs were taken?
A. I do not.
R. D. Q. 154. Were other photographs taken while that work progressed?
A. Not to my knowledge.
R. D. Q. 155. State if any of these show anything about the means of pouring concrete by gravity?
A. The pipe is in evidence on Exhibit 44-A—both on the floor where indicated and then there was a pipe overhead, showing the free end with a couple of men at the end. Exhibit 44-C shows [fol. 512] several men using pipe and the pipe overhead leading down where it is being used for delivering concrete—free end held by one or two men. All of this was on the Majestic Theater and part of the balcony construction. Exhibit 44-D shows the front of the Majestic Theater on the Broadway side after building is up two stories and the suggestion of a tower on the south side of the building under course of being raised. Some of these photographs indicate that some of the pouring had been done when that picture was taken.

R. D. Q. 156. You don't know the date even approximately of these photographs being taken?

A. About February or March of 1908—maybe the latter part of January, 1908—perhaps the middle of January, 1908.

R. D. Q. 157. Might they have been taken in April, 1908?

A. They might have been, but I hardly think so. My recollection of it is that we got about that far into the construction about that time—January, February or March of 1908.

R. D. Q. 158. What concrete work did Callahan tell you he had superintended at the time he applied for work with you?

A. Don't think there was any in Los Angeles. He mentioned some foundation work in Denver and Colorado Springs, where he said he had had previous experience. Most of his experience had been on brick work and carpenter work. My recollection is he told me he had had some experience in both Colorado Springs and Denver.

R. D. Q. 159. Did he tell you that he had had previous work in connection with a gravity system?

A. No. Nothing in a gravity system as a whole. He said he [fol. 513] had tried or experimented on the mixture of concrete and he said that he had mixed some and put it in a basement by a wooden trough.

R. D. Q. 160. He said nothing to you then about a tower in that conversation?

A. Yes, and when I analyzed his qualifications he explained in a general way the idea that afterwards developed into the gravity system as a whole, by claiming that he had overcome the defects of the mixture of concrete by chuting it down a wooden trough into the basement. He also explained that he was very anxious to get on a large concrete building so that he could develop some ideas of his that he had in perfecting what afterwards developed into the gravity system, by raising the tower and the boom and a swivel and a pipe hung to the tower that had a vertical movement all of which was very interesting because it was a new idea. That, in connection with his other qualifications, which I explained, I immediately offered him a job as sub-foreman on a large concrete building, with the understanding I would let him carry out the ideas he had explained to me for the delivering of concrete by what afterwards developed into gravity system.

R. D. Q. 161. You talked with Emtman about a gravity system you say prior to January, 1908?

A. No, not about a gravity system in its entirety—some parts which afterwards developed what now is the gravity system. In the way of details I had many conversations with Emtman.

R. D. Q. 162. Did you talk with him about a guy wire?

A. I did not.

R. D. Q. 163. Did you talk with him about a tower?

A. No.

R. D. Q. 164. Did you talk with Callahan about a guy wire?

A. No, I don't think I did.

[fol. 514] R. D. Q. 165. Did you talk with Callahan about a tower?

A. I don't remember doing so. Mr. Callahan explained to me that he was going to chute concrete by gravity from a tower. The tower was an old idea of construction work and a great many people did use it and it was an accepted piece of apparatus that on many occasions was in vogue, as far as concrete construction work was concerned.

R. D. Q. 166. You have said that the talks were general. Now, did you have any talks that were specific with either Emtman or Callahan where they named parts rather than stating results that they proposed to accomplish?

A. When Mr. Callahan applied to me for a position he went over in a general way what he intended to do in detail, and it all sounded reasonable enough to try, and that included everything that we had there and anything we might add to, to get certain results. As far as Emtman was concerned, most of my conversations with him were to get a mixture of concrete that would flow by gravity where the rocks would not separate from the cement, sand and gravel, and it was the mixture Mr. Emtman and I had most of our conversations on previous to these dates of 1907.

R. D. Q. 167. Do you mean 1907?

A. Previous to December, 1907, or January, 1908—when the gravity system was first used on the Majestic Theater by Mr. Callahan. Mr. Emtman was our superintendent and foreman on a great many jobs and was a thorough mechanic and we consulted him a great many times from many angles on a great many jobs, and, as I stated a minute ago, as far as the mixture of concrete was concerned, was what Mr. Emtman was trying to work out more than anything else, as far as any special details were concerned, according to my recollection.

[fol. 515] By Mr. Barton: Please repeat to the witness the previous question.

(Question repeated.)

A. Mr. Callahan, when he applied for the position, explained in detail what afterwards developed into a whole gravity system. Any conversation I have had with Mr. Emtman was based more on the mix and not the apparatus of what afterwards developed into the gravity system as a whole. When I say gravity system as a whole, I mean a complete gravity system.

R. D. Q. 168. Now state specifically any parts of the structure which Mr. Callahan mentioned to you at that time.

A. Well I have explained about a pipe and a boom supported by the tower that would develop into a vertical movement. I asked him the possible expense of inaugurating such a system, and, after discussing that, found out it was nominal compared with what we had already had on the job, which was a tower, skip and mixer,

and I gave him instructions to develop any ideas he might have from a practical standpoint.

R. D. Q. 169. Did he mention guy ropes or wire to hold the pipe?

A. Don't remember that. Just presumed he had to hold pipe up on the tower with some method, and when it was developed it proved to be a wire or cable.

R. D. Q. 170. Did he use the word "boom" to you at that time?

A. I don't think he did. He said arm, or stick or support.

R. D. Q. 171. Are you sure he used the word "stick"?

A. He might have.

R. D. Q. 172. Are you sure?

A. No, I am not.

R. D. Q. 173. Or did he use the word "arm"?

[fol. 516] A. I am quite sure he used either one of these words —either "arm" or "stick" or "timber." He might have used the word "boom," but my recollection is he used those other words, as I have previously expressed.

R. D. Q. 174. Was Mr. Emtman present at the conversation?

A. No, he was not.

R. D. Q. 175. Who was besides yourself, if anyone?

A. Don't think anybody was present at that time besides Callahan and myself. When I analyzed a man for a position I treated it in the nature of a personal matter—didn't think it was necessary to have anyone present. In fact, when anyone was present under conditions of that kind, I made it a point to talk to a man by himself.

R. D. Q. 176. Were the distributing gravity pipes supported at any time on that job by guy wires or ropes from the tower?

A. Was the pipes supported from the tower by ropes or guys? Yes.

R. D. Q. 177. Were they supported at any time on trestles or carpenter horses?

A. Yes, some parts of it. Presuming you wanted to pour a building 100 feet in length and you had 75 feet of pipe, these pipes generally came in lengths from 10 to 20 feet and you would have to put horses under some part of it which was a part nearest the floor where it was convenient, but never under the first one or two chutes. That was always supported either by stick, arm or boom with guy wire from the tower. Some parts of the pipe were even supported by men holding it up on their shoulders. That was near the free end or spout where you were going to deliver it. Some of it was hung over part of the structure work. If a long length of pipe was bought you could take it and put swivels from [fol. 517] two or three different lengths so as to give you the vertical movement at the free end, also deliver it in the place where it is desired from time to time without moving all the pipe. I should have said horizontal swinging movement instead of vertical. I get the two terms mixed.

R. D. Q. 178. You have described difficulties you had in making the mush flow through the pipe. You said you finally substituted

an 8-inch pipe for the smaller pipes. Can you tell when you substituted the 8-inch pipe for the smaller pipe?

A. We started with a 4-inch pipe on the Majestic Theater building and found it was too small because it clogged. Within not more than two or three days we had made and on the job a 6-inch pipe, which gave us better results, as far as clogging was concerned. It was about two weeks before we discarded that and had the 8-inch pipe. I judge from the use of the 4-inch till we got the 8-inch pipe it was less than four weeks.

That is all.

Recross-examination by Mr. Hood:

R. X Q. 179. In Question No. 25 you were asked as to whether you wished to be understood as saying that the mast—that is, the particular mast shown in the Emtman patent—was installed at the Majestic Theater prior to January, 1908, and your answer is not entirely clear. Will you please state whether or not, in answering Question No. 25, you had in mind that the question referred to the particular obstruction which you had just described in your answer to Question No. 24?

By Mr. Barton: This question is objected to as improper. The witness has made a statement that is perfectly clear, and in the [fol. 518] question he has been virtually directed by his counsel to modify it. It is quite improper.

A. In my answer I had in mind the previous question. I got the mast confused with Callahan's arm or boom. Wish to also state that a great many authorities have different names for different parts of different apparatus. It is very difficult for me to be technical on something new.

By Mr. Barton:

R. D. Q. 180. Did you see the work as it progressed on the Timken Building in San Diego?

A. I did. Not as often as I inspected the work in Los Angeles because it was out of town, but every three or four weeks, perhaps every month or two months, I would be in San Diego for the inspection of any jobs we had under operation.

Deposition closed.

Hugh W. Bryson.

Wednesday, March 9, 1921.

Met pursuant to adjournment at 9:30 o'clock a. m.
Same counsel present.

L. A. Parker, the next witness called in behalf of the defendants, having been duly sworn, testifies in response to questions of counsel as follows:

Direct examination by Mr. Barton:

Q. 181. Please state your name, age, residence and occupation.

A. L. A. Parker; age 38; residence, 460 Witmer Street, Los Angeles; occupation, architect and engineer.

Q. 182. I show you photographs marked Exhibits 44-A, 44-B, 44-C and 44-D. Please state if you know what they represent and who took them, if you know.

[fol. 519] A. Progress photographs which I took during the construction of the Majestic Theater.

Q. 183. Did you take other progress photographs of that job?

A. Yes, sir—took them along as the building progressed.

Q. 184. And have you the plates? If not, state what you did with them.

A. I have them, although I don't know whether I can lay my hands on them right now. I was recently burned out and don't know whether I can weed them out of the shuffle. They can be had.

Q. 185. Are you able to fix the dates of the taking of these several photographs?

A. Well, I can by referring to our records; that is the only way.

Q. 186. What was your work in connection with the Majestic Theater?

A. I had complete charge, as far as—well in the first capacity I was associated with Mr. Mayberry as engineer on the building for the architect and then after the construction work started we were employed by the Hamburger Realty & Trust Co. as their superintendents, and in the division of our work in the office I had charge of all the outside work while my partner had the inside. Of course, that put me in absolute authority as far as the supervision of the work was concerned and looking after the interests of our clients.

Q. 187. It appears in other testimony that the F. O. Engstrum Co. were the contractors. Also that Mr. Theodore Emtman had something to do with that work. Do you remember meeting Mr. Emtman in connection with that job?

A. Yes, of course, Mr. Emtman was the general superintendent [fol. 520] of the job. He was down there on the work off and on until later when they put him on another job where he was in charge continuously.

Q. 188. You may state what, if anything, these photograph exhibits I have shown you disclose with respect to distributing cement.

A. Well, of course, two of them actually show the distributing of the concrete, and the other one shows the concrete completed, and this one—Exhibit 44-D—well, that just shows the building with the 4th floor poured.

Q. 189. Do you see in that Exhibit 44-D any tower for raising cement?

A. Yes, it looks as if part of that is a tower, because it shows some of the steel work of the columns on the south side of the building; therefore, it must be the tower.

Q. 190. I understand that you are not able to fix the exact date of the taking of these photographs, except by reference to your records?

A. That is the only way I could fix them exactly. If I could get our superintendent's reports, I could give them positively, but I do not know that those are available.

Q. 191. State, if you remember, the name of the general foreman who was on that job.

A. George Eberhard. George was not there at the very first, but came about the time the first floor was started, as I remember.

Q. 192 Do you know where he is now?

A. No, I don't, haven't seen him for five or six years—maybe longer.

Q. 193. You will produce the memorandum or refer to it and later inform counsel as to the results, I understand?

A. That is, if I can produce it. Here is the point—Mayberry [fol. 521] handled all the clerical end of our business. Now, I haven't—to my knowledge—those records at all. If I can get the information from Mr. Mayberry, I will produce it.

Direct examination closed.

Cross-examination by Mr. Hood:

X Q. 194. You stated in direct examination that other progress photographs were taken of the Majestic job. Did any of the negatives, other than those of Exhibits 44-A, 44-B, 44-C, and 44-D that were printed, show the particular apparatus, which was used to pour the concrete?

A. No others that I could find, but I do know there were some others taken.

X Q. 195. But so far as you know those others did not show in any greater detail than those which you have produced, the particular apparatus which was used for pouring the concrete?

A. I do know I took some up on the 6th, 7th and 8th floors, but for some reason or other haven't been able to find those. Of course they would show much more than these.

X Q. 196. You have made a search for those photographs of the 6th, 7th and 8th floors' progress, and have not been able to find them?

A. Yes.

X Q. 197. In your direct examination you were asked about the apparatus which was used in handling or placing the concrete. Will you describe as nearly as you can the character of that apparatus used—say, in placing the concrete for the inclined auditorium floor?

A. That is, it was used here and throughout the rest of the building? (Witness points to the Exhibits 44-A, 44-B, 44-C and [fol. 522] 44-D.) You mean to start at the beginning so far as the actual pouring of the concrete was concerned after it was mixed?

X Q. 198. Yes.

A. The concrete is dumped from the mixer into a concrete hoist, which runs up the tower to hopper and then from the hopper into a receiving chamber or device, that, in turn, spouts it into the pipe.

X Q. 199. In your last answer you have used the present tense. Were you intending to decribe the apparatus that was actually used on the Majestic Building?

A. Well, in that I merely enumerated in sequence how concrete travels from the mixer to the pipe. Well, I can put it in the past tense and say it did.

X Q. 200. Well, that is the kind of construction that was used on the Majestic job?

A. Yes, sir.

X Q. 201. Do you remember how the pipe, that you have referred to, was supported?

A. Well, at the tower it was supported one way and at the distributing end it was supported differently. At the tower it was supported by their block and tackle and rope they used to pull lumber up, and of course they used their wire, that they tie forms with. I can't remember that particular point, but I know that was the general method by which it was supported. Then the pipe, after of course it got past the span from the tower to the balcony and had a chance to support it further it might have been on a brace down on to the concrete, or it might have been a 2x4 nailed across a couple of posts that would be present, and in that way it carries it to the end where it would be on either a movable device or a permanent one, in order to swing the pipe and distribute the concrete into the forms.

X Q. 202. Now in that apparatus there was a mixer that was [fol. 523] placed in a pit in the ground so the top of the mixer was about even with the ground so that it could dump the concrete into the hopper.

A. This mixer was probably on top of the ground on that particular job, although that is immaterial; it depends upon the lay of the land. My recollection is the mixer was on top of the ground and the hopper was in a pit,

X Q. 203. What do you mean by the hopper—the hoist bucket?

A. A skip, I should say.

X Q. 204. And that skip was arranged in a hoisting tower along side of building?

A. Used to know the name of skip—seems to me it was the Raymond skip—that steel bucket anyway.

X Q. 205. When they built the tower to get ready to use this pipe system they carried it up considerably higher than the usual practice for carrying a tower, where they simply used it to hoist and deliver into wheelbarrows?

A. That was always the case. A tower was always carried quite a little in advance of the story they were operating on.

X Q. 206. On that particular tower, when they got ready to use this pipe, they set the hopper very much higher than was usual for the wheelbarrow method, didn't they?

A. Naturally, yes, sir.

X Q. 207. And that hopper had a control gate at its distributing mouth?

A. Yes, sir, a regulation gate.

X Q. 208. Then, as I understand it, there was a device—what you called a swinging device on the tower—in position to receive the discharge from the hopper?

A. You say swinging device?

X Q. 209. Yes.

[fol. 524] It was fastened to the end of the pipe. They were collapsible pipes that were used and this one in which the concrete was received from the hopper was open on the top with the end of it slipped into the pipe.

X Q. 210. It was a sort of a pan-like affair, was it?

A. Pan—that is what it was.

X Q. 211. And that was mounted on a vertical pivot of some kind so it could swing in a horizontal plane?

A. I don't remember how it was mounted, but, of course, it would have to swing. The concrete going on one side of the building at one time and then you would have to move it over to the other. Of course, it does swing in that sense of the word.

X Q. 212. Well, it actually did swing, didn't it?

A. Oh, yes.

X Q. 213. Well, then, that pan-like affair had its discharge in pipe form and that was sleeved into some more pipe sections?

A. Yes, sir.

X Q. 214. And the lower end of that second pipe section, that was sleeved over the pan spout, was supported by a block and tackle or guy wire that was fastened to the lower end of pipe and carried back to the higher point on the tower, wasn't it?

A. Yes, sir; I don't just remember whether it was the lower end. It was all open space out in front of tower to balcony, and in coming that far it would be supported by maybe one or two, I don't really remember.

X Q. 215. About how long was that space it had to bridge over to get to balcony—just approximately?

A. I am trying to think between which columns it was set. Those columns were about 20 feet on centers; that means it might be 30 feet, or if it was between the second or third columns it would be about 30 feet. I will tell you the balcony came in between the [fol. 525] first and second of those large ones at the end, so it might not be more than 20 feet, although, as I said before, it might be as much as 30 feet.

X Q. 216. Then at the lower end of that pipe section that was supported by this guy wire, there was another pipe section swivelled to the first pipe section so it could swing around horizontally, the vertical axis being at the lower end of the pipe section supported to guy wire? Is that your recollection?

A. They probably used a couple of elbows. I do not remember the exact details. My recollection is they used two elbows, one on the upper pipe and then had the other to come out at whichever

angle they wanted it to with the second pipe; that is, provided they were not spouting right, and if they were spouting at that location, as on photograph, simply one elbow and then down.

X Q. 217. It is your recollection that that apparatus, when it was once installed, was used continuously during the rest of the operations on that building, and practically all the concrete was poured through those pipes?

A. It did not work quite as successfully as that, as we had trouble at first on the size of the pipe, but in principle—yes.

X Q. 218. They did chute quite a bit of concrete through the first pipe used, didn't they?

A. The very first pipe demonstrated immediately it was too small, but it was only a case of a couple of days' time when they could have some more made, and when they used the larger size it seemed to be satisfactory.

X Q. 219. When they used the larger size pipe it worked all right?

A. Then it was all right.

[fol. 526] X Q. 220. Now, do you recall that shortly after they began using that apparatus they found it necessary to put a brace from the tower out to the lower end of that first pipe section?

A. A brace from the tower out to the pipe section?

X Q. 221. Yes. That is, a brace that was pivoted to the tower at a point below this receiving pan quite a distance and then projecting outwardly and upwardly and secured at its outer upper end to the outer lower end to the pipe that was suspended by a guy wire from the top of the tower?

A. Why, I know that that method was used.

X Q. 222. It was used on the Majestic Theater job, was it?

A. I can't state absolutely, positively, that it was used right then at this particular time, although I know specifically, though, there was a similar device that the pipe was carried on.

X Q. 223. Do you mean on the Majestic job?

A. Yes, on some of these longer spans, and when it was necessary for a man to climb out on the pipe to knock the concrete loose, which was the only means by which it could be supported.

X Q. 224. You mean there was some kind of a pivoted boom arrangement that helped to support the pipe?

A. Yes, it moves with the pipe.

X Q. 225. What is your recollection as to the approximate time when they first began to pour concrete through this pipe system at the Majestic Theater?

A. Well, as I said in the beginning, I would have to refer to our records for that. I don't care to approximate as it is too long ago, without referring to my records.

X Q. 226. The use of this apparatus with its swinging pipe supported by the tower throughout the rest of the construction of [fol. 527] the Majestic Theater Building produced an entirely satisfactory concrete building?

A. Very much beyond my expectations, because I was really very reluctant as to its use in the first place. I was afraid of it. I was

afraid of it because I did not think we could control the mixing of the concrete. I was afraid they would have to mix too wet in order to have it flow through the pipes, and in making it this way I knew by experience it would separate, and, of course, that is a very important point of concrete: that the rock, sand and cement shall not separate, but, to our satisfaction, we found out that, if the concrete was too lean—that is, not enough cement—it would not flow, so that was an inspector, in a way, to keep the contractor from skinning the job, and also, when it was properly mixed—that is, the right consistency—it would flow the best through the pipe, so that if the contractor wanted to use the system he knew it would have to be exactly mixed to give the best results in the structure, and he had the use of the system besides, so it worked pretty good on both sides.

X Q. 227. Do you recall that there was on that job a man by the name of Lee Callahan, who seemed to have quite a bit to do with this chuting apparatus?

A. Well, as far as quite a lot to do, I don't remember that. Lee Callahan was one of the straw bosses.

X Q. 228. In this photograph, Exhibit 44-D, the part which you think is part of the tower is about the center of the picture at the top?

(Shows Exhibit 44-D to witness.)

A. Yes, sir.

X Q. 229. That looks to me as though it were in process of construction and being raised to a higher point. What is your idea about it?

A. That is very evident. Simply because the posts are at different [fol. 528] heights and you can see a board across there, which might be the temporary platform for the continuing up of the construction.

X Q. 230. Then the appearance of this photograph Exhibit 44-D and the fact that no hopper on swinging pipe or guy line are shown, would not justify the inference that the apparatus which you have described was not used on this building, would it?

A. No, it showed that it was.

X Q. 231. I understood you to state that one of these photographs "showed the concrete completed." Which photograph was that?

A. It was 44-B. That is the statement I made, and I really referred to 44-B. That is incorrect because the steel is already there; it is completed as far as cantilevers are concerned.

X Q. 232. Was any of the concrete of this building in place prior to the time they began to use this pipe and chute system?

A. Oh, yes, sir.

X Q. 233. And how had that been placed?

A. That was placed with wheelbarrows and runways and the regular customary chute for chuting it into the walls. You see there was very little floor until you got up to this point—mostly walls.

X Q. 234. And that had been tamped in place?

A. Well, yes, it was tamped with the chute, as a matter of fact, but it had been delivered in wheelbarrows and runways.

X Q. 235. But when you got to using this pipe method you did not have to do nearly as much tamping?

A. No, because it had to be properly mixed before you could put into place and it eliminated that additional tamping or puddling, rather, in mixing it.

X Q. 236. This chute arrangement, which you describe, was put [fol. 529] into use in the beginning of the placing of the concrete for the inclined auditorium part of the first floor, and about the time when some of the forms at the front of the building had been carried up to about the second floor level, wasn't it?

A. No. I don't remember. As a matter of fact I don't think the gravity system was used on the first floor at all.

X Q. 237. You are not prepared to say it was not?

A. I know when I was looking through the plates to select these I did have a photograph of the first floor, but there was nothing on that plate which showed any of the gravity system; for that reason, I did not pick it out, so I doubt if it was actually used on the first floor.

X Q. 238. But you are not prepared to say it was not?

A. No, but to my best recollection it was not. It was simply from there up that it was.

X Q. 239. You found that the use of this new apparatus, which you have described, made quite a saving in the cost of placing concrete, did you?

A. Yes, sir. I think, if I am not mistaken, I gave the Engstrum Co. a letter at one time highly approving it.

X Q. 240. You found at that time that there was a decided improvement over the wheelbarrow method?

A. I did, because we got a much better mix and my interest was that of my clients, no matter what the job was—naturally.

X Q. 241. It is your opinion, by the use of that apparatus, they produce a better building?

A. Better building at less expense to the contractor, in which case everyone was benefited.

[fol. 530] Los Angeles, California, March 10, 1921.

Met pursuant to adjournment.

Same counsel present.

The examination of the witness Parker continued.

Redirect examination by Mr. Barton:

R. D. Q. 242. Have you consulted any memoranda since your last examination, by which you can fix more definitely the progress of the work upon the Majestic Theater Building? If so, produce such memorandum for inspection, if you please.

A. I have, and will produce our original bookkeeping records of payments from the Hamburger Realty & Trust Co.

R. D. Q. 243. Refreshing your recollection by reference to that

memorandum, which you hold in your hands, will you state as nearly as you can the progress of that work?

A. Well, we have a charge against the Hamburger Co. of $50.00 for supervision for one-half month up to September 30, 1907, which shows that they started to run concrete as early as the middle of September, because in our arrangement with the Hamburger people we were to go on the job as soon as they started to run concrete, but, of course, they had done the excavating and some form work previous to that time.

R. D. Q. 244. Please go on and state further advances that were made in that work.

A. Well, then, during the month of October, we put in our continuous services and in November one-half month and December two-thirds of a month and then full time after that until the end of July.

R. D. Q. 245. What was the reason for your not making a charge for all of November?

[fol. 531] A. They ceased our services.

R. D. Q. 246. And was the reason stated for stopping your services?

A. Yes, sir. Up to that time the work had gone along so nicely, that they assumed that the job would take care of itself, and they could save our expenses; that is, the expense of our services on the job, so, as we were the engineers on the building employed by Edelman & Barnett, the architects, but which employment did not include any supervision as it had been previously arranged that the Hamburger Realty & Trust Co. would pay the supervision, and on that agreement we started the middle of September until the middle of November.

R. D. Q. 247. Will you state whether you were at that time meeting the foreman George Eberhard and Mr. Bryson, who is present here, and Mr. Emtman?

A. Of course, Mr. Emtman was the foreman on the job, and on my instructions went to him and, of course, my discussions were with him as to the interpretation of the drawings, as far as Mr. Emtman is concerned, I don't remember any particular conversation, although I know that he was on the job, because he was the general superintendent and naturally would be there. As far as Mr. Bryson is concerned, it was just "good morning," but no discussion as to policies, that I can remember, were ever taken up with him. Of course, he was one of the heads of the firm, but he, in turn, put the responsibility on the foreman that he put on the work.

R. D. Q. 248. And what discussion, if any, was had with respect to pouring the cement by gravity?

A. You mean at the time?

R. D. Q. 249. Yes.

A. I really don't know that there was any; at the time we were [fol. 532] having other difficulties with the Hamburger Co., and I doubt very much whether the question of pouring came up while we were then in litigation with the Hamburger people.

R. D. Q. 250. And when did it come up?

A. I think it came up very shortly after we were put back on the work.

R. D. Q. 251. What was that date?

A. Approximately the 10th of December.

R. D. Q. 252. Was it discussed then with Eberhard?

A. Yes, sir.

R. D. Q. 253. And was Emtman present or looking after the job?

A. He might have been, but I don't remember definitely, except right at the very first, but I don't think Eberhard was there exactly at the start, although he might have been.

Recross-examination by Mr. Hood:

R. X Q. 254. Mr. Parker, you stated that you "started to run concrete" in September, 1907. You meant by that term, did you, that you started to place the concrete by the wheelbarrow method, which you have previously described?

A. Yes, sir.

R. X Q. 255. Now, do you recall definitely any conversations with anybody on that job prior to, say a week before Christmas, 1907, where any particular apparatus was discussed as intended to be used to pour concrete through chutes or pipes?

A. Let's see—a week before Christmas—that would be about the 18th, that would be practically a week after we resumed work there. Well, I would imagine offhand, that the discussion came in about that time—that is, after the 10th.

[fol. 533] R. X Q. 256. That is, there was some discussion as to a possible desirability of pouring concrete?

A. They put the proposition up to us and it looked pretty good, but we did not give them absolute authority to go ahead. It was a case of trying it out or showing us it would produce before they got our final sanction.

R. X Q. 257. Did Mr. Bryson put the matter up to you?

A. I don't remember that he did personally, or who it was offhand. I would assume it would be Eberhard, as he was the man we looked to for such things. It was put up to us by someone from the Engstrum organization.

R. X Q. 258. Now, having refreshed your memory from this record, what can you say as to the probable time when the apparatus, which included the tower, the skip, the hopper, the revolving pan and the 4-inch pipe connected to the pan and suspended from the tower by the block and tackle, was first erected and an attempt made to use it?

A. Well, I know that it was used on the balcony first and, of course, the walls directly under it, and it was at the time they were getting ready or were ready for the operation of putting up the forms for this balcony, that our little misunderstanding with the Hamburger Co. came up, when we wrote them the letter that we would not be responsible for the engineering. As that was the most difficult piece of concrete engineering and construction

that had been attempted, it was at that time the longest cantilever that had ever been built in reinforced concrete, and we felt the responsibility as engineers naturally, and we insisted that we have the supervision for it; therefore, they were starting the form work about the middle of November 1907, for that, or the form work [fol. 534] might have been possibly in, but I know the concrete wasn't poured then. After we resumed operations around the 10th of December, it would take at least two weeks, if not more, to get ready to run that balcony, although the second floor in the south part of the building was already run at that time. They could not possibly have started running concrete before the last week of December, and it might have been the first week of January, but I don't think it could have been the last week because that kind of work goes a little slow, being a new type of construction.

R. X Q. 259. Well now, when you have talked about "running" concrete prior to Christmas of 1907, you mean placing it with wheelbarrows?

A. I am quite positive there was no gravity system used before Christmas.

R. X Q. 260. And then the gravity system was used very shortly after Christmas?

A. As soon as the form work in the steel could be placed for that balcony; then it was used.

R. X Q. 261. Either the last week in 1907 or the first week in 1908?

A. Yes.

R. X Q. 262. You don't recall ever having received from Mr. Emtman any specific instructions as to the building of an apparatus, including this pipe system for running the concrete, do you?

A. Not as coming from Mr. Emtman. I did, of course, coming from the Engstrum Co., but as to the individual, it is too long ago to remember that detail.

Recross-examination closed.

By Mr. Barton:

R. D. Q. 263. The forms that were in place in November were utilized for pouring later by gravity?

[fol. 535] A. You say the ones that were in place in November?

R. D. Q. 264. That you had placed in November?

A. Were anticipated, you mean, to have been poured by gravity?

R. D. Q. 265. I will put the question again. In November, 1907, you say certain forms had been installed for receiving the cement. Those same forms, I take it, were left there and they were filled by the use of the gravity apparatus that was subsequently improvised. Is that correct?

A. If they were the form for the balcony, yes, but I am not positive, as I stated in the first place, that the balcony forms were already up, or whether they were about to put the form work in,

when we were called off, but, of course, they were working continuously on the building while we were off, but no concrete run during that period.

R. D. Q. 266. Did you have a conversation with Fred Engstrum about this matter?

A. I don't remember exactly, except I was on the job when the gravity system was used. Fred's father, in fact, the whole Engstrum force, were naturally interested in the new device, and they were all there to see the first chute.

By Mr. Hood:

R. X Q. 267. Do you recall when the elder Mr. Engstrum died?
A. Yes, sir.
R. X Q. 268. Please state it.
A. About the 16th of June, 1920, as I am informed.

Deposition closed.
Signature waived.
Notary's certificate waived.

By Mr. Barton: Counsel for defendants states that he had arranged to have Mr. Harrison Albright as a witness on the morning [fol. 536] of the 8th inst. I would say that inquiring at his office that morning and at his residence, he was informed that Mr. Albright had gone to San Diego; that he would be back last evening. This morning on inquiry, he has been informed that Mr. Albright is still in San Diego, but expected back this evening. That he is informed that Mr. Albright was the architect of the Timken Building in San Diego, on which counsel infers from Mr. Callahan's preliminary statement he based his claim of having reduced the invention of the patent in suit to practice in the fall of 1908. That he will be ready to call Mr. Albright just as soon as he returns. Mr. Albright stated that he would appear without subpœna, and it is believed he will do so. Counsel for defendants has no objections to counsed for plaintiffs proceeding at the present time with any proofs he may have.

By Mr. Hood: It having been an agreement between counsel for plaintiffs and Mr. Jones of counsel for defendants that counsel for plaintiffs would adduce by deposition proofs relative to Callahan's operations in California during the years of 1907 and 1908, by way of deposition immediately following depositions to be adduced on behalf of defendants in California, providing defendants adduced all of the testimony which they proposed to adduce by deposition prior to deposition on behalf of plaintiffs, counsel for plaintiffs asks counsel for defendants whether he has any other depositions to adduce as primary proofs for defendants.

By Mr. Barton: As at present advised, no—except Mr. Albright, and possibly some testimony in surrebuttal.

By Mr. Hood: In view of the above statement, counsel for plain- [fol. 537] tiffs states that he will offer every possible co-operation in obtaining the deposition of Mr. Albright, but that, in view of

the very considerable waste of time during this week, waiting for witnesses for defendants, he feels that he cannot stay over in Los Angeles beyond the close of depositions to be taken on behalf of plaintiffs, immediately.

Counsel for defendants is hereby notified, in accordance with notice previously given to the principal counsel for defendants, that Lee Callahan will be examined as a witness on behalf of plaintiffs at the offices of Frederick L. Lyons, 312 Stock Exchange Building, Los Angeles, California, beginning at 9:30 a. m. tomorrow, Friday March 11, 1921. In addition to Mr. Callahan, the following witnesses will also be called and examined: Edward Anderson, 1114 North Hoover Street, Los Angeles, California; Hooper O. Anderson, 4447½ South Hope Street, Los Angeles, California.

Chicago, Ill., Saturday, April 2, 1921.

Met pursuant to notice at 10 o'clock a. m.

Present: Arthur M. Hood, and George Bayard Jones.

ARTHUR H. BANNISTER, a witness produced on behalf of defendants, being duly sworn, testified as follows:

By Mr. Hood: Counsel for plaintiffs objects to the examination of this witness, except in surrebuttal, on the ground that the time within which it was agreed that depositions on behalf of defendants might be adduced has expired, and in accordance with said agreement plaintiffs have begun the taking of depositions in rebuttal. Further depositions on behalf of defendants in direct defense are [fol. 538] therefore improper without special permission of the court or without consent of plaintiffs.

Examination by Mr. Jones:

Q. 1. Please state your name, age, residence and occupation.

A. Arthur H. Bannister; age, 44; residence, 6000 South Park Avenue, Chicago, Illinois; salesman for the Brownell Improvement Company, Chicago.

Q. 2. What is the nature of your work?

A. Soliciting orders for crushed stone to be used in highway and building construction.

Q. 3. How long have you been with this company?

A. I started to work for this company in 1902.

Q. 4. What work were you engaged in in 1909?

By Mr. Hood: Objected to as immaterial, as being subsequent to the date of the application upon which the patent in suit is based. Also objected to for the reasons set forth in the objection stated at the beginning of this deposition, and it is understood that such objection may be considered, without repetition, as entered to every question answered not surrebuttal.

A. In the spring and summer of 1909, in the construction of the Pennsylvania R. R. track elevation at Grand Crossing, Illinois.

In October, November and December in the construction of the Lake Shore & Michigan Southern Railway, Dock No. 2, at Ashtabula, Ohio.

Q. 5. If this Ashtabula dock involved the use of concrete, please describe the apparatus which you used in placing the concrete.

By Mr. Hood: Objected to as immaterial on the ground that it relates to apparatus and occurrences subsequent to the date of [fol.539] the application upon which the patent in suit is based. It is understood that the above objection may be considered as entered wherever applicable throughout this entire deposition.

A. In starting this contract, I had four railway car mixers; two of them discharging the concrete into wheelbarrows or carts in front of the mixer; two of the concrete mixers were equipped with rubber belt conveyers, which would carry the concrete away from the mixer a distance of 35 feet. This method was satisfactory for foundations, but when we started the construction of the walls we found that we had to have some contrivance to get the concrete up; so I had one of the mixers with the belt conveyer elevating the belt as high as was practicable, so that the concrete wouldn't run back, and from there on to the top of the wall I conveyed the concrete in wheelbarrows by building a scaffold. This was an expensive method of operation and I asked permission of my company to let me construct a tower on the end of the mixer car, directly above the mixer. I secured a mortar bucket and placed a pair of leads on the outside of the tower to act as a guide for the bucket. In this way I was able to elevate the concrete up to a receiving hopper and from this hopper I had a chute which went out to the top of the wall.

Q. 6. Have you any photographs of this apparatus?

A. I have.

By Mr. Jones: Witness produces three photographs which are marked for identification Defendants' Exhibit 50, Photographs A, B, C, Ashtabula Dock Photographs.

By Mr. Hood: The photographs are objected to as irrelevant, immaterial, not properly proven, and improperly presented.

[fol. 540] Q. 7. Is the belt conveyer you referred to shown in these photographs?

A. They are. In 50-A this conveyer is shown on the left-hand side of the picture.

Q. 8. How long had you been using a concrete distributing device of this character?

A. Since 1903.

Q. 9. I call your attention to a photograph on page 149 in the Engineering News of Feb. 28, 1901, and will ask you to compare the apparatus illustrated and described therein with the apparatus shown in part on the left-hand side of this photograph you have just referred to.

By Mr. Hood: Objected to as referring to a publication not properly pleaded.

A. Our mixer machine was of the same make as picture shown in the cut from Engineering News of Feb. 28, 1901.

Q. 10. Describe a little more fully how your device operated, beginning with the sand, stone and cement.

A. The sand, stone and cement was conveyed from the material cars to the mixer in wheelbarrows; after concrete was mixed in the mixer, it was dumped into a concrete hoist bucket and hoisted to the ceiling hopper in the tower, and from there conveyed by means of a chute to its resting place.

Q. 11. Please describe the earlier apparatus which you say is of the same make as that in the Engineering News referred to.

A. The stone, sand and cement are conveyed from the material car to the mixer in wheelbarrows and deposited in the mixer. After the concrete has been mixed, it is discharged into the rubber belt conveyer, which conveys the finished product to its resting place.

[fol. 541] By Mr. Jones: This photograph of the Engineering News will be found with a number of others and named and offered in evidence at a later date.

Q. 12. Please read the marked portion of the description and state to what extent it describes the apparatus which you used at Ashtabula.

By Mr. Hood: Objected to as referring to a publication not properly pleaded.

A. It was the same method used by me at Ashtabula.

Q. 13. The question related to apparatus, not methods.

By Mr. Hood: Objection repeated.

A. It was the same make of apparatus I used.

Q. 14. To what extent were the details the same?

By Mr. Hood: Objection repeated.

A. The mixing and conveying of the concrete.

Q. 15. This description refers to a boom. Did your apparatus have a boom?

By Mr. Hood: Question objected to as leading, and as relating to a publication not properly pleaded.

A. The boom referred to in this article is the same as I used, but I never called it a boom—called it a belt conveyer.

Q. 16. How did the mounting of your boom or belt conveyer compare with the marked description?

By Mr. Hood: Last objection repeated.

A. Same construction.

Q. 17. Explain more fully the objection to this boom conveyer

in your use of it at Ashtabula, with reference to the concrete running back.

A. The Ashtabula Harbor contract called for wet concrete, and this conveyer type of mixer was intended for a dry mixed concrete. The conveyer could not be elevated very high or the concrete would run back.

[fol. 542] Q. 18. How long a period had you been using dry concrete before this date?

A. Almost entirely up to that time.

Q. 19. During the period from 1902 to 1909, what kind of concrete had you seen used on these boom conveyers?

A. Mostly dry concrete.

Q. 19a. How did it happen that this particular job called for wet concrete, in Ashtabula?

By Mr. Hood: Objected to as relating to matters subsequent to the date of the application upon which the patent is based. Objected to further as incompetent.

A. It was so specified by the engineering department of the railroad.

Q. 20. Have you any idea why these specifications were different from the usual specifications relating to your work?

By Mr. Hood: Objected to as incompetent.

A. There had always been a difference of opinion amongst engineers as to which was the best type of concrete, a dry or a wet mix, and about this time a great number of the large railroads had changed their specifications from dry concrete to wet.

Q. 21. Was there any discussion of this subject?

A. Yes, at engineering society meetings and most all of the technical journals of that time contained articles for and against the different types of concrete.

Q. 22. Please read your answer to Q. 10 and describe any details of your apparatus not mentioned in your answer.

A. There is one word wrong; that ought to be receiving hopper instead of "ceiling hopper."

Q. 23. Please read the question.

A. I think everything has been given unless you wish to ask [fol. 543] some questions about the construction of this car.

Q. 24. You have made no mention of the member projecting to the right at the top of the tower; what is this?

By Mr. Hood: Objected to as leading and as immaterial.

A. It is what I call a boom, and it is placed there to help support the concrete chute.

Q. 25. Describe the manner in which it is secured to the tower.

A. On the opposite side from the chute in the tower this boom is bolted at one end; on the chute side of the tower there is placed under the boom a carpenter's dolly. This gives the boom a chance to move back and forth easily, as it rides on this dolly.

Q. 26. How many bolts were there in the boom?

A. One at the back of the boom, two bolts running from the timber dolly up through the boom to hold the dolly secure to the boom stick.

Q. 27. Describe more fully the operation when the dolly ran back and forth.

A. Whenever we wanted to move the chute sideways, it being supported by the boom, it made it move back and forth easily on account of this dolly arrangement.

Q. 28. What effect did the bolt at the back of the boom have on this back and forth movement?

A. It held the boom in place.

Q. 29. Can't you describe the character of the movement a little more fully. For instance, how could the boom move back and forth if it was bolted in place?

A. The nut on the bolt wasn't tightened up tight.

Q. 30. Describe more in detail the back and forth movement of the outer end of the boom and the inner end of the boom.

A. The outer end of the boom could move each way as far as the [fol. 544] tower timbers would permit it. The end of the boom where the bolt was remained in place.

Q. 31. Then the outer end of the boom moved in an arc of a circle about the bolt as a pivot; is that correct?

A. That is.

Q. 32. What is a carpenter's dolly?

A. It consists of a roller, an axle, a timber platform above the roller supported by brackets from the axle, and is used in handling heavy timbers.

Q. 33. Is it a sort of little carriage?

A. That's it.

Q. 34. Please describe more in detail how the chute was supported.

By Mr. Hood: The question is objected to as immaterial. Attention is again called to the fact that the apparatus under discussion was not produced until—certainly not earlier than October, 1909, nine months or more after the date of the application upon which the patent in suit is based. Counsel for plaintiffs protests against the encumbering of the record with evidence of this character, especially at this late stage, contrary to agreement, in violation of the Equity Rules and without permission of the court.

By Mr. Jones: While defendants' counsel presented his evidence prior to the California depositions, he stated that in taking the California testimony last, in order to avoid more than one trip to the Coast, he did not intend to bar himself from presenting such further testimony as might be based on new developments, and the present testimony, and the William G. Fargo testimony, concerning which notice has been given, came to light about the time the California depositions were being taken. Although requested by defendants' [fol. 545] counsel in a formal motion, the court declined to set dates for the taking of testimony by depositions, although consenting to depositions.

A. At the tower end of the chute said chute was held in place by a bolt through the floor of the chute into one of the tower timbers; the center of the chute was supported by a cable from the boom.

Q. 35. Through how much of an angle could the boom swing?

A. I don't know the angle, but it swung enough to deposit the concrete in a 50-foot section on one side of this mixer car.

Q. 36. After one section was finished, what would you do next?

A. We would have our steam locomotive push the mixer train, including the mixer car, ahead to the next 50-foot section.

Q. 37. How was the hoist bucket arranged on the tower?

A. The hoist bucket was placed in a pair of timber leads on the outside of the tower in front of the mixer.

Q. 38. Who was responsible for the design or arrangement of this complete apparatus?

A. Myself, with the help of my foreman.

Q. 39. About when did this apparatus first go into use?

A. About the latter part of October, 1909.

Q. 40. Prior to this time had you ever seen concrete apparatus comprising a chute hung from a boom on a tower and receiving concrete from an elevated hopper?

A. I had not.

Q. 41. This idea was original with you, was it?

A. It was.

Q. 42. How do you fix the date you have just given?

A. By our contract—our signed contract with the Lake Shore [fol. 546] & Michigan Railway, and by post cards and letter received. The contract was entered into on the 18th day of September, 1909, between the Lake Shore & Michigan Southern Railway and the Brownell Improvement Company. (Witness examines contract) Contract is signed by Mr. D. C. Moon, General Manager of the Lake Shore & Michigan Southern Railroad, and by W. L. Hodgkins, Vice President of the Brownell Improvement Company.

Q. 43. Is Mr. Hodgkins at the office this morning?

A. He was not at the office up to the time I left at 9 o'clock. (Witness telephones his offices.) He is not at his office today.

By Mr. Jones: This contract is submitted to Mr. Hood for inspection.

Witness produces a letter postmarked November 16, 1909, Chicago, Illinois, and a post card postmarked Ashtabula, October 22, 1909. This letter and card I will mark Defendants' Exhibit 51, Bannister Correspondence.

Q. 44. State the circumstances attending the mailing of these papers.

By Mr. Hood: The question is objected to as relating to matters wholly irrelevant and immaterial, and, so far as the letter is concerned, as incompetent on the ground that this witness cannot have personal knowledge as to the mailing of a letter addressed to him.

A. We were making good progress on our contract and I suppose that our vice president wished to express his appreciation of the progress is why I received the letter from him dated November 16, 1909. It is as follows:

[fol. 547] "Mr. A. H. Bannister, Supt., Ashtabula, Ohio.

"DEAR SIR: I note with pleasure your reports of the 12th and 13th and wish to congratulate you on same.

"Very truly yours, Brownell Improvement Company. W. L. Hodgkins, Vice Pres."

By Mr. Hood: Objected to as irrelevant and immaterial.

Q. 45. More specifically, to what work did the congratulations relate?

By Mr. Hood: Last objection is repeated.

A. It covered the whole field.

Q. 46. What was the occasion for the congratulations?

Mr. Hood: Last objection repeated.

A. One of the reasons was the rapid progress we were making with the tower mixer.

Q. 47. Where has this letter been since you received it?

A. I have kept it with my personal letters.

Q. 48. Where did you get the three photographs which you produced as exhibits?

A. Some one on the work at Ashtabula Harbor had these pictures taken and I secured these copies, as a number of the workmen had cameras and had taken pictures of all the different machines.

Q. 49. About how long have you had these pictures?

A. Since receiving them in 1909.

Q. 50. Please answer the earlier question relating to the post card in Exhibit 51.

A. On October 22, 1909, I wrote and mailed the post card picture to Mr. Harry Walker, 7544 South Chicago Avenue, Grand Crossing, Illinois; said post card shows the ore machines placed on the concrete docks that we constructed the year before, 1908.

[fol. 548] Q. 51. Have you used any apparatus like that shown in the Ashtabula photographs since the completion of that work?

A. Yes, on most all of our construction contracts after that time.

Q. 52. Can you produce any further illustrations of your subsequent apparatus?

By Mr. Hood: Objected to as irrelevant and immaterial.

A. Yes, there is a photograph of our tower mixer in the Engineering News of August 12, 1915, page 316.

Q. 53. Are you the A. H. Bannister referred to on page 317 of that article?

A. I am.

This copy of the Engineering News of August 12, 1915, is marked for identification Defendants' Exhibit 52.

By Mr. Hood: The exhibit is objected to as irrelevant and immaterial and useless encumbering of the record.

By Mr. Jones: We rely also on other articles in this copy relating to the chuting of concrete, including the editorial on page 321. Also pages 289, 306, 316 and 318.

By Mr. Hood: The date of the publication being August 12, 1915, long subsequent to the issue of the patent in suit, it is clearly incompetent.

Q. 54. Are you the A. H. Bannister whose name is given as the designer of a concrete spade, on page 336 of this magazine?

A. I am.

Q. 55. Did you apply for a patent on your tower apparatus of Exhibit 50?

A. I did not.

[fol. 549] By Mr. Hood: Objected to as irrelevant and immaterial.

Q. 56. Why not?

A. I did not consider it as much worth, as at that time I only intended to use it on that particular contract.

Q. 57. Of what material were the chutes made on this Ashtabula job?

A. They were made out of lumber lined with sheet iron.

Q. 58. Have you ever used any other kind of chutes?

A. Yes, steel chutes and grain bucket chutes.

Q. 59. Explain the grain bucket chutes.

A. In grain elevators they have a flexible bucket chute which conveys the grain to both ends of a box car. This gave us the idea that we could use the same kind of a chute to convey concrete in foundation work, as we could move it around, it was flexible; and as the work progressed coming up a section could be taken off at a time.

Q. 60. Explain, for the benefit of the court, what the word "bucket" means and what these sections look like.

A. Why I call them a bucket chute is on account of—they are in two-foot sections in length, round-shaped like a bucket, large at one end and smaller at the other; each one fitting into the other one; and held in place by a chain on the outside.

Q. 61. And were these grain pipe sections successful for the distribution of concrete?

A. In foundation work, yes.

Q. 62. Did you try them on any work other than foundation work?

A. I did not.

Direct examination closed.

By Mr. Hood: Counsel for plaintiffs moves to strike the entire [fol. 550] deposition on the ground that it is wholly irrelevant and immaterial, relating, as it does, to matters wholly subsequent to the

date of the application upon which the patent in suit is based, and being in no part surrebuttal, and without the consent of the court or consent of plaintiffs.

Counsel for plaintiffs further moves that defendants be required to pay to plaintiffs the entire costs involved in attendance at this session, owing to the character of the deposition.

Cross-examination by Mr. Hood without waiver of objections:

X Q. 63. What was your position with the Brownell Company during the year 1909?

A. Superintendent of construction.

X Q. 64. What experience had you had prior to 1909, which in your opinion qualified you to fill the position of superintendent of construction?

A. I had been superintendent of construction for the Brownell Improvement Company from 1903.

X Q. 65. And what experience had you had prior to 1903 which qualified you to act as superintendent of construction?

A. I had done material work for three railroads previous to that time, handling construction materials.

X Q. 66. How large a concern was the Brownell Company in 1909; what sort of business did they do and what was the extent of their business?

A. Our construction work consisted of the elevation of railroad tracks in cities; our principal contracts were the elevating of the Pennsylvania Railroad in the City of Chicago, from 22nd St. to 102nd St.: the elevation of the Lake Shore & Michigan Southern tracks in the City of Chicago from 69th St. to 102nd St.; these two elevations include the Grand Crossing layout, which includes the [fol. 551] elevation of the N. Y. C. & St. L. Railway. We also elevated the two miles of the C. & P. Ry. in Cleveland, Ohio. Also elevated the Santa Fe's, C. & A.'s and M. C. Ry.'s elevation in Joliet, Ill., and the construction of Dock No. 1 at Ashtabula, Ohio, in 1908.

X Q. 67. Briefly stated, what were your duties during the years 1903 to 1909, inclusive, as superintendent of construction?

A. I had full charge of the supervision and executing of the contracts under which my Company contracted to perform.

X Q. 68. You determined the character of apparatus and equipment which was to be used on each job, did you?

A. I used what equipment we had available, and if I needed any other equipment which we did not have I secured same by asking the office for their permission.

X Q. 69. You were the responsible head in the actual construction work, were you not?

A. Of my contract; there was a general superintendent who supervised all of the company's contracts.

X Q. 70. You mean by your last answer that you were the responsible head of the construction on the particular contracts of which you were given charge?

A. Yes.

X Q. 71. I suppose that required practically daily supervision by you of the progressing work, the equipment, the work in force, etc.?

A. It did.

X Q. 72. When did you first see an apparatus like that shown in Fig. 1 on page 149 of the Engineering News of Feb. 28, 1901, to which your attention has been called, in use with the belt conveyer in a position with its delivery end raised above the receiving end, as shown in that figure?

A. In 1902.

[fol. 552] X Q. 73. And you were quite familiar with the use and capabilities of that apparatus from 1902 to 1909, were you?

A. Yes, I was.

X Q. 74. Did the endless belt in that apparatus carry cross-bars or were they flat surface belts?

A. Flat surface with pulley.

X Q. 75. That is, the surface upon which the concrete was carried was a smooth surface?

A. It was.

X Q. 76. Well, you couldn't use that apparatus to handle a wet concrete, could you?

A. We would if the conveyer was on about a level of elevation.

X Q. 77. Even then you couldn't handle what is now commonly known as mush concrete, could you?

A. No.

X Q. 78. Your work as superintendent of construction for the Brownell Company during the years 1903 to 1909, inclusive, involved the superintendence of construction of a very large amount of reinforced concrete, or at least of concrete work, did it not?

A. It did.

X Q. 79. Is the hoist bucket shown in any one of the photographs forming Defendant's Exhibit 50?

A. Yes, in 50-B and 50-C. It is the device at the bottom of the tower at the side facing the observer, and just above the railroad tracks in 50-B. In 50-C the bucket is in dumping position.

X Q. 80. In Defendants' Exhibit 50-B, I notice an upwardly and outwardly extended arm, the upper end of which appears to be propped under the outer end of what I understood you to call a boom. I have designated this part on photograph 50-B by the letter X and an arrow. Is this the part that you say is a cable?

A. It is.

[fol. 553] X Q. 81. Will you please examine this photograph with a magnifying glass and see whether you want to make any change in your last two answers?

A. Looking at this picture with a magnifying glass, it looks that in place of it being a cable it looks like a piece of timber running from the tower to the bottom of the boom.

X Q. 82. You never saw this apparatus, which you say you used at Ashtabula, with a timber in the position indicated by the picture Defendants' Exhibit B, did you?

A. I don't remember seeing that.

X Q. 83. The timber or "dolly," to which you have referred, was bolted on the under side of the part you called the "boom," and rolled on a special timber provided for it and forming part of the tower structure; is that correct?

A. It is, it did.

X Q. 84. That timber had to be a fairly wide timber, did it not?

A. It did.

X Q. 85. It was a special wide timber placed in the tower structure to form a platform for the dolly?

A. It was.

X Q. 86. You found that this apparatus was very substantially beneficial in speeding up the work on No. 2 Dock at Ashtabula, did you not?

A. I did.

X Q. 87. And by its use you were able to decrease the number of laborers you were required to use if you used the old wheelbarrow method?

A. Yes.

X Q. 88. And you were able to place the concrete at considerably less expense than you could have done by the wheelbarrow method?

A. Yes.

Cross-examination closed.

[fol. 554] Redirect examination by Mr. Jones:

R. D. Q. 89. The brace shown in Exhibit 50-B is not shown in 50-C, is it?

A. It is not.

R. D. Q. 90. Is there anything in the post card picture Exhibit 51 which appears in the photograph 50-C?

A. Yes, the Hewlett ore machines.

By Mr. Jones: Referring to the objection made to this testimony, defendants' counsel wishes to state that these three photographs, Exhibit 50, were mailed to Mr. Hood several days ago, together with two affidavits and photographs relating to Webber Dam Spouting Apparatus used in Michigan in 1906, and Mr. Hood was given an opportunity to stipulate as to either of these two cases if he wished to do so.

By Mr. Hood: Counsel for plaintiffs have no sufficient data upon which to justify the proposed stipulation.

Deposition closed.

Signature of witness waived.

Met at 1:45 p. m.

Present: As before.

It is hereby stipulated that if Walter Cahill were called as a witness for defendants, he would testify that on August 3, 1910, he executed a contract on behalf of the Great Lakes Dredge & Dock Company,

said contract being executed also on behalf of the Iroquois Iron Company and relating to the building of complete foundations and dock ore yard for a two-blast furnace steel plant, this being the contract referred to in answer to Q. 74 of the Alderman deposition.

[fol. 555] EDWARD J. FUCIK, a witness called on behalf of the defendants, being first duly sworn, testified as follows:

By Mr. Hood: Counsel for plaintiffs objects to the examination of this witness, except in surrebuttal, on the ground that the time within which it was agreed that depositions on behalf of defendants might be adduced has expired, and, in accordance with said agreement, plaintiffs have begun the taking of depositions in rebuttal. Further depositions on behalf of defendants, in direct defense, are therefore improper without special permission of the court or without consent of plaintiffs.

Examination by Mr. Jones:

Q. 1. What is your name, age, residence and occupation?

A. Edward J. Fucik; 32 N. Hamlin Ave., Chicago, Ill., age, 41; occupation, vice president and assistant general manager Great Lakes Dredge & Dock Company.

Q. 2. Outline the character of the work this company engages in.

A. It operates on all the Great Lakes, in Philadelphia, New York and Albany, in dredging operations, and concrete foundations of steel plants, docks, concrete docks, bridge foundations.

Q. 3. What has your previous training and experience been?

A. It covers a period of twenty years, beginning in 1901, when I graduated from the University of Illinois, the College of Civil Engineering, and covers construction work which brought me in contact with concrete work for practically the entire period of twenty years.

Q. 4. State briefly what experience you have had in concrete work prior to the time you became associated with the Great Lakes Dredge & Dock Company.

[fol. 556] A. I was civil engineer in the employ of the Sanitary District of Chicago for four years, beginning in 1901, in the fall, was engineer in immediate charge, field engineer, in the construction of the foundations and superstructure of the Randolph St. Bridge over the Chicago river. Then was principal assistant engineer for a design of a high pressure water system for the City of Chicago, with George W. Jackson; then at Lockport, on the Lockport power development, for the Sanitary District of Chicago, up to the middle of 1907; then back again to Chicago with George W. Jackson as erecting engineer of the superstructure of Dearborn St. Bridge over the Chicago river, and also engineer in charge of the construction of a concrete disposal station shaft at Madison St. and the Chicago river, ending connection with George W. Jackson about April, 1908, and from June, 1908, to date with Great Lakes Dredge & Dock Company as construction engineer, estimating engineer, division engineer, assistant general manager and vice president.

Q. 5. Prior to 1908, had you ever seen chutes used for distributing concrete?

A. Yes, in—it was in about 1902, the spring of 1902, in placing the concrete for the east foundation of Randolph St. bridge; Jackson & Corbett used chutes to lead the concrete from the mixer down to the foundation. A year later they were used in a similar manner—a year later as far as my personal observation goes—they were used in a similar manner on the south foundation of the State St. bridge by the Great Lakes Dredge & Dock Company.

Q. 6. How were these chutes supported?

A. They were supported at Randolph St. bridge by resting on the bracing of the coffer dam, the mixer being 14 or 15 ft. higher than the bracing at the water line, and from there on led down into the [fol. 557] foundation and were hung by cables—from cables—so that they could be moved freely around inside the coffer dam, giving a radius of delivery of the concrete of about 25 ft. from the fixed point of support of the chute.

By Mr. Hood: Answer is objected to as relating to a structure and use not properly pleaded.

Q. 7. How did you happen to see these two construction jobs you have referred to?

A. The two jobs were being done for the Sanitary District by different contractors, and it was my custom to visit around the different construction jobs close by to keep informed of construction methods, I then being a young engineer just out of college and naturally it would be to my interest to become as well informed in that line as possible. That brought me into contact with other construction engineers and contractors and of course we would exchange ideas.

Q. 8. What was the consistency of the concrete used prior to 1908?

A. In order to answer that I would have to go back to 1901 and '02, for at that time, about 1902, there was considerable agitation among engineers of all kinds dealing with foundations, as to wet or dry concrete. The engineering fraternity was divided into two camps about that time, one advocating a concrete mixed quite dry and thoroughly tamped, and the other advocating using a concrete mixed quite wet or mixed to a consistency which would enable it to flow easily, and which did not require tamping after being placed. This agitation, to my knowledge, extended over a period of about five years, the wet fellows arguing that from a constructional standpoint the concrete was easier and more cheaply placed and made a more dense mixture. About this time, also, 1902, I joined the Western Society of Engineers and attended the meetings quite fre- [fol. 558] quently, and heard papers read by different engineers on both sides of the question. The use of reinforcing steel in concrete became more customary about 1902, and a former professor of civil engineering of the University of Illinois, Prof. Pence, read a paper before the Western Society of Engineers, describing tests he

had made as to the expansion coefficient of concrete, with relation to the expansion coefficient of steels.

By Mr. Hood: The answer is objected to as secondary, not the best evidence.

Q. 9. What effect did the knowledge of these experiments have on the use of wet concrete?

A. These experiments brought out the fact that it was possible to use steel and concrete together, so far as the expansion coefficient was concerned, and following this with the increased use of reinforcing steel in concrete it was almost imperative that a wet concrete be used in order to have it properly placed around reinforcing steel. Really, according to my opinion, the introduction of reinforcing steel made it imperative that concrete more of a consistency of a liquid be used in order to build the structures then being designed, and this fact made it imperative that in handling this liquid concrete the chute or trough come into play.

Q. 10. Is this Prof. Pence the W. B. Pence whose remarks are quoted in the transactions of the American Society of Civil Engineeers, part E, 1902, page 596, a copy of what purports to be a part of which is referred to in the supplemental answer in this suit and which I show you?

By Mr. Hood: The question is objected to as assuming matters not true; this witness has been merely shown a typewritten sheet containing certain unidentified matter.

[fol. 559] A. I am a member of the American Society of Civil Engineers. There is only one William B. Pence a member of that Society. If that is a true copy of those proceedings, that would be the William B. Pence.

Q. 11. What is the present view regarding the relative merits of wet and dry concrete?

A. The chemical engineers have been very active the last few years and the present practice is to aim at a more exact determination of the amount of water that should be used in mixing concrete. The practice is still to use concrete wet enough to slide through chutes, although within the last five years hydrated lime has been added to the mixture to increase or to facilitate the use of concrete—the placing of concrete through troughs and chutes.

Q. 12. Have you used chutes since your present connection began in June, 1908?

A. Yes.

Q. 13. Please refer to the photographs in Defendants' Exhibit 17 and describe briefly any of the apparatus shown therein with which you may be familiar.

By Mr. Hood: Reference to the various parts of Defendants' Exhibit 17 is objected to for the various reasons set forth in objections heretofore entered in connection with the attempted identification of the exhibits, it being agreed that such objections heretofore stated may be considered as entered wherever applicable to

all questions and answers of this witness relating to the said exhibit or the structures illustrated therein.

A. Referring to Exhibit 17-B, it is a picture of a floating mixer working on a pumping station foundation. This was one of the jobs I estimated for the Great Lakes Dredge & Dock Co. and subsequently followed through in its construction. I saw the mixer [fol. 560] shown in this exhibit on that work during the year—within the year it was marked, that is, 1909. My recollection is that this mixer went from that job at Gary by water to South Chicago and was there shortly after that time, and I also saw it working in the Illinois Steel Company's plant in the construction of the concrete top of one of their docks.

Referring to 17-C, which shows a picture of a concrete tower—a concrete hoisting tower, delivery hopper, concrete chute, and supporting booms. I had considerable to do with the calculation of costs of this work, which was the foundations and dock work, ore yards, for the blast furnace plant of the Iroquois Iron Company. We built two of these rigs complete for this particular job and the writer and our general manager, the general manager of the company, were directly responsible for the introduction of these rigs with practically all the main details, as shown on the print or the picture. I recollect distinctly the conference I had with our general manager, at which the booms for handling the chutes were brought out. The layout of the work made it imperative that we have a rig which would be able to deposit concrete fully 100 ft. from the point of mixing, so we elaborated a little on the mixing plant shown on 17-B and produced those shown on 17-C. So far as I knew, these booms were the first we had ever heard of in this particular locality —of such a large size.

17-D shows one of the towers shown on 17-C. I saw the plant shown on 17-D at work in Toledo—that is, on an inspection trip to that port I passed through that work, did not stop particularly for any length of time. That's all I have to say, I guess.

By Mr. Hood: The answer is objected to as wholly irrelevant and immaterial, on the ground that it relates to occurrences and apparatus subsequent to the date of the application upon which the [fol. 561] patent in suit was issued.

Q. 14. Did you and the general manager apply for a patent on this Iroquois Iron concrete apparatus?

A. No.

By Mr. Hood: Objected to as immaterial.

Q. 15. Why not?

A. Mr. Lutz and I considered this Iroquois rig a slight improvement over the older rig we had been using and did not think it was a radical enough departure from our former method of handling concrete to warrant bothering about a patent.

Q. 16. Where is Mr. Lutz now?

A. He is vice president and general manager of the company, but not in the city at present, being at Biloxi, Miss., on a vacation.

Q. 17. What is the purpose of the pulley block and hook shown above the hopper of photograph C?

A. That is used to adjust the height of the hopper on the tower according to the distance the concrete needs to be delivered from the tower.

Q. 18. When did you first use this tower apparatus of photograph C?

A. Oh, along the end of the summer of 1910.

Q. 19. Have you ever used such apparatus since that particular job?

A. Practically continuously since. There may have been slight modifications, of course, in the detail connections between the booms and the chutes. We have even gone back, in cases, to a rig shown on 17-B.

Q. 20. Of what were the chutes constructed in photograph C?

A. They were made of sheet steel. We roll them in our own shops, I think, at South Chicago.

[fol. 562] Q. 21. What cross-section?

A. Oh, about 12-inch diameter. They weren't chutes, they were pipes really.

Q. 22. What is the apparent enlargement at the upper end of the pipe and how is it secured to the hopper?

By Mr. Hood: Objected to as relating to a structure since Jan. 21, 1909.

A. The enlargement was a controlling device at the bottom of the hopper so as to control the flow of concrete from the hopper to the pipe. It is secured to the hopper with a sort of sliding connection or what you would call a flexible connection, so as to enable the pipe to be swung around in all directions from the tower and hopper, the hopper being stationary, and the pipe, of course, movable. We have the same thing on our hydraulic dredge, almost, which enables the dredge to be swung around in all directions and the pipe is fixed.

Q. 23. Explain more fully how the dredge is swung around and the pipe fixed.

A. The dredge is pivoted at the aft or rear end by means of a heavy spud timber or beam which is dropped to the bottom of the river or lake and locked to the hull after being dropped. The pipe is fastened to the rear end of the dredge by means of one of these flexible connections and the forward end of the dredge, which is the suction end, swings on this spud point with the length of the dredge and the length of the ladder frame to which the suction is attached as a radius. The pipe, which is from 12 to 24 inches in diameter, depending on the size of the machine or dredge, is supported on pontoons in the water and is stationary at that point.

Q 24. How long have you been using such dredges?

A. About fifteen years. The company has been using hydraulic dredges about seventeen or eighteen years to my knowledge.

[fol. 563] Q. 25. Was this enlargement referred to in your answer to Q. 22 secured to the hopper or to the pipe?

A. It was secured to the pipe.

Q. 26. By a sliding connection to enable the pipe to be swung around in all directions, do you refer to a swivel connection?

A. Yes, the connection might be called a swivel connection in that one part overhangs, overlaps, and slides on the other or fixed part.

Q. 27. Are you familiar with the blue-print, Defendants' Exhibit 27?

A. Yes, I made the tracing from which this blue-print was taken off, and made it specifically for the purpose of showing the movements of the two tower mixers shown on 17-C, the print being in the nature of a progress chart based on movements of concrete mixers.

By Mr. Hood: The answer is objected to as immaterial on the ground that the tracing is shown to have been produced subsequent to the date of the patent in suit.

Q. 28. When did you make this drawing?

A. A few days before the date shown on the print, May 6, 1911.

Q. 29. Whose initials appear in the lower right-hand corner?

A. They are mine, E. J. F.

Q. 30. Was it necessary to brace or guy the towers of the Iroquois iron concrete apparatus?

A. Yes, we used steel cables in two directions only.

Q. 31. Was there any secrecy about the development or the use of these various concret distributing structures that you have been describing in this deposition?

By Mr. Hood: Objected to as immaterial.

A. No.

[fol. 564] Q. 32. Were any working drawings made of these 1909 and '10 structures?

A. No.

Q. 33. Why not?

A. It was necessary to build them in a hurry and our custom is for the executive head to plan certain methods and devices for a certain piece of work, call into conference the field superintendents or foremen in charge of the particular work, sketch out with lead-pencil sketches our notions and ideas, and the foreman or superintendent does the rest with the aid of penciled sketches. This was the case with the towers shown on 17-C, in which case the speed of construction was of the utmost importance.

Q. 34. About when would you say you first conceived the use of a boom or booms for supporting the concrete pipe of this apparatus?

A. It must have been about July or the latter part of June, 1910.

Q. 35. How do you fix this 1910 date?

A. The contract was signed about August some time, and we

put in a proposal for the work in June and I think we received a verbal acceptance of our proposal in July some time and so we immediately got busy to organize the work as to methods and machines.

Q. 36. What year was this?

A. This was in 1910; the job was completed in 1911.

Q. 37. Are you familiar with the catalogue, Exhibit 19?

A. Yes.

Q. 38. By whom was it published?

A. By the Great Lakes Dredge & Dock Company; it was gotten out by the Great Lakes Dredge & Dock Co.

Q. 39. Can you produce the original photograph from which the two-page illustration on pages 32 and 33 was made?

[fol. 565.] A. Yes. It's the same picture shown in the catalogue as can be seen by inspection. I have the original picture here in my hand in Album No. 31 of our Progress Chart Album; the picture is picture No. 14591, dated Oct. 19, 1910, showing a view of the entire construction of the Iroquois plant under way at that time, and was taken in the ordinary course of our progress photographs of the work.

By Mr. Hood: Answer is objected to as irrelevant and immaterial in view of the fact, among others, that the date of the photograph is Oct. 19, 1910, a year and nine months after the date of the application upon which the patent in issue is based.

Q. 40. What was the practice of your company, during the first four or five years that you were with them, with reference to taking and preserving photographs of their work?

A. The custom was to take pictures, photographs of work in progress at irregular times with special stress being laid on pictures or photographs of the plant employed on the work.

Q. 41. What facilities do your branch offices have for keeping in touch with each other's work?

A. Our custom is to interchange photographs—that is, each division receives photographs of work in progress from all the other divisions, and special—and the information is further detailed by letters or personal visits of the operating managers.

Q. 42. For how long a period have you been familiar with the various photographs that you have referred to in Exhibit 17?

A. From the date of the various photographs to which I have referred.

Q. 43. Where are the plates of the photographer Christy whose name appears on these photographs?

[fol. 566] A. Christy died some years ago and we bought some of his plates. I do not know whether these Iroquois pictures, the plates of the Iroquois pictures, are in the plates we bought from Christy.

Direct examination closed.

By Mr. Hood: Counsel for plaintiffs moves to strike the deposition from the record, and tax costs against defendants, for the reasons set forth in connection with the depositions of Bannister and Folwell.

Cross-examination by Mr. Hood without waiving objections:

X Q. 44. The use of steel rods and bars imbedded in concrete, for the purpose of strengthening the concrete under tension, was well-known to engineers considerably prior to 1901 and '02, was it not?

A. Not in this country. The French were one of the early users of steel imbedded in concrete, and the use of this combination of steel and concrete was known but not well known. Shortly after 1901 it became well-known enough to admit of its practical use by constructors.

X Q. 45. What kind of chutes did you see used for handling concrete in June, 1908?

A. They were semi-circular—some were semi-circular in cross-section and some were rectangular in section; the chutes were from 10 to 15 feet long. I used these kind of chutes, both semi-circular and rectangular, in February, 1908, at Madison St. and Chicago River, in Chicago, being then in direct charge of the construction.

X Q. 46. And how were they supported?

A. In the particular instance which I have in mind, one end of the chute was fastened to the mouthpiece—to the discharge piece—of the mixer by means of chains; the other end led down—the chute [fol. 567] led down into a shaft 40 feet deep and was supported with cables fastened to the bracing in the pit.

X Q. 47. You found that the apparatus illustrated in Defendants' Exhibit 17-C enabled you to place concrete at a less cost than you could have placed it by wheelbarrows, did you?

A. Yes.

X Q. 48. Is the Great Lakes Dredge & Dock Co. contributing to the defense of this suit?

By Mr. Jones: Objected to as immaterial and outside the scope of the direct examination.

A. No.

X Q. 49. Is it contributing to the payment of attorney's fees?

By Mr. Jones: Same objection.

A. No.

Cross-examination closed.
Deposition closed.

Chicago, Ill., Monday, April 4, 1921—10 a. m.

Parties met pursuant to adjournment. Present: As before.

Russell H. Folwell, a witness produced on behalf of defendants, being duly sworn, testified as follows:

By Mr. Hood: Counsel for plaintiffs objects to the examination of this witness, except in surrebuttal, on the ground that the time within which it was agreed that depositions on behalf of defendants might

be adduced has expired, and, in accordance with said agreement, plaintiffs have begun the taking of depositions in rebuttal. Further depositions on behalf of defendants, in direct defense, are therefore improper without special permission of the court or without consent of plaintiff.

[fol. 568] Examination by Mr. Jones:

Q. 1. Please state your name, age, residence and occupation.

A. Russell H. Folwell; age, 50 years; Chicago; occupation, engineer and contractor.

Q. 2. State the character of the work in which you are engaged, and outline briefly your past experience.

A. The business in which I am principally occupied is designing and building structures of steel and concrete, more particularly grain elevators, flour mills, municipal and industrial work, involving the use of concrete and steel.

I was educated in Cornell University, graduating from there in 1894; was then employed as draftsman for the Detroit Bridge & Iron Works two years, Great Northern Railroad four years, principally engaged in designing construction of their grain elevators, one of steel construction at Buffalo with a storage capacity of 2½ million bushels, the other at Superior, Wisconsin, a steel structure of 3 million bushels' capacity. In 1901 I became associated with Barnett & Record Co. of Minneapolis, as chief engineer and treasurer. In 1905, to 1916, I was chief engineer and partner in James Stewart & Co., since which time I have been in business in my own organization, Folwell-Ahlskog Co.

Q. 3. Where were you in February of this year?

A. I was in Norfolk, Va.

Q. 4. How long were you away from Chicago on that trip?

A. From the latter part of January to latter part of February.

Q. 5. Did you receive any communication from me with reference to testifying by deposition in this case?

A. I received a letter while I was in Norfolk, just leaving Norfolk.

[fol. 569] Q. 6. Where did you go from Norfolk?

A. Went to Baltimore, New York, Pennsylvania—Philadelphia.

Q. 7. When you reached your office were you advised as to inquiries from me regarding your return?

A. Yes.

Q. 8. Please examine Defendants' Exhibit 11 and state whether you are familiar with it.

A. Exhibit 11 is a blue-print No. 58, made in the Barnett & Record office Oct. 22, 1904; it was drawn by a draftsman named Frank Dustin under my direction. And Sheet 89, blue-print drawn by draftsman named H. W. Benneche, is dated Feb. 7, 1902, and was drawn under my direction. Sheet No. 58 shows the details of a spout to the mill from a grain elevator at the Minnesota Linseed Oil Co., Minneapolis; the spout was circular, 11½ inches in diameter, made of No. 14 steel, about 60 feet long on the horizontal and about 36 feet high. It was supported on a ½-inch galvanized

steel cable with hanger cables every 12 feet 9 inches at top. The spout is made in sections, 12 feet 9 inches long, which were fitted together.

Q. 9 Whose long-hand initials R. H. F. appear on these two blue-prints?

A. They are my personal initials, made by myself.

Q. 10. When did you put your initials on the tracings?

A. At the time the tracings were finished and given me to be checked and approved; I presume it was about the date of the drawings.

Q. 11. Was the apparatus shown on these two prints ever used?

A. The apparatus was constructed in accordance with the plans as shown.

Q. 12. Was it successful or unsuccessful?

A. Successful.

Q. 13. What connected with the upper ends of the spouts shown in these two prints?

[fol. 570] A. The upper ends of the spouts were constructed with an enlargement forming hoppers, and grain spouts were connected to them in the elevator.

Q. 14. Describe these grain spouts briefly.

A. I haven't sufficiently definite recollection of those grain spouts to describe them. I can't remember which particular spouts went into those hoppers.

Q. 15. What were the prevailing spouts used at that time?

A. All types of movable and fixed spouts were used in grain elevators at that time. Of the movable type, those in the grain elevators were either portable or so constructed that they revolved around a fixed point. A great many patents were taken out on spouts in those days, among them the Mayo spout and the Robinson spout, the Bird spout and Parker spout. The last four of the revolving type were used in grain elevators generally under scale hoppers. Outside of the buildings they had spouts for shipping grain to cars, which were generally fixed in position with a telescope end either with one opening or two, so arranged that grain could be thrown into either end of the car. There was another type of spout for shipping grain to boats or vessels; these spouts were generally supported on booms, either horizontal or inclined. The spouts were made to raise and lower about a hinge at the top, also to revolve in a horizontal direction, at an angle of about 180 degrees, or as far back as the building or structure upon which they were supported. These dock spouts also had outer sleeves which telescoped lengthwise on the upper section, so that the spout could be made longer or shorter to suit the requirements of the vessels which they were loading. A good many details in the different kinds of dock spouts have been patented. I recall one in particular was a Ballinger spout, which was installed in the Great Northern elevator at Superior, [fol. 571] Wisconsin, in 1900.

Q. 16. Please examine the blue-prints, Defendants' Exhibit 29, and state if you are familiar with any of the devices shown therein.

A. Blue-print WG-575 is a diagram drawing of the Ballinger

Dock Loading Spout, manufactured by the Webster Mfg. Co., at Chicago, for the Great Northern elevator at Superior, Wisconsin.

Q. 17. Who designed the Great Northern elevator?

A. I was chief engineer in charge of the designing for the Great Northern elevator and the design of the elevator was worked out jointly with Mr. Ballinger, who was then superintendent of grain elevators for the Great Northern Railroad.

Q. 18. State whether you have ever seen apparatus such as shown in the remaining blue-prints of this exhibit.

A. I have never seen the apparatus shown on WG-581 as actually constructed, which shows a Ballinger spout with an inclined boom. I, however, have seen a similar spout on the harbor elevator galleries at Montreal, which had the inclined boom but did not have the Ballinger slotted sleeve.

By Mr. Hood: References to the construction at Montreal are objected to as irrelevant and immaterial.

Q. 19. What did the boom support?

A. The boom supported a spout of similar character with an upper revolving section and a lower sleeve that was closed, in which detail it differed from the Ballinger spout. As I understand, the distinctive element of the Ballinger spout was the slot in the top of the lower section or telescoping sleeve, so as to allow the upper swiveled section to be supported by the tackle at the extreme lower end.

[fol. 572] Q. 20. Do you know whether inclined booms of this general type have been used in the United States for supporting downwardly inclined grain pipes?

A. I know from my general information that they have been used in this country at New Orleans and Portland, Maine, but I personally never have seen them in either of these places.

By Mr. Hood: The answer is objected to as incompetent, hearsay.

Q. 21. I call your attention to a copy of J. L. Record patent 657,335, Feb. 5, 1901, Adjustable Coal or Ore Spout, and will ask if you know anything about the patentee of the apparatus.

A. I know Mr. J. L. Record, who is the same Mr. Record of the firm of Barnett & Record Co., with which firm I was associated as chief engineer for several years. The patent drawings indicate a spout that was used on the Curtis Bay Coal Dock of the Baltimore & Ohio Railroad at Baltimore, which dock was built in 1900, just previously to the time that I became associated with Barnett & Record. I recall that I checked over the drawing of the coal spouts for this dock in Barnett & Record's office when I first went with them. As I recall, there was some mechanical interference of one part of the apparatus with another part. These spouts were made by the St. Paul Foundry Co., but the nearest I have ever come to seeing them was when I passed by the coal dock at Baltimore several years ago; I didn't examine the spouts closely or the dock at that time.

By Mr. Hood: The answer is objected to as largely hearsay and wholly irrelevant and immaterial, and an unnecessary incumbering of the record.

Q. 22. Was this mechanical interference overcome?

A. I don't recall the exact cause of the mechanical interference, [fol. 573] but I believe it had something to do with not having sufficient clearance between one part and another; I presume the matter was properly fixed, as we never heard anything more in the office about the trouble.

By Mr. Jones: This patent will be added to the answer by amendment and offered in evidence later with the other patents relied on.

Q. 23. Do you know the witness, W. R. Sinks, whose name appears at the end of the claims?

A. I do. I've known Mr. Sinks since 1900. He was superintendent of construction for Barnett & Record during the period in which I was associated with that company, 1900 to 1905, at which time he and I became partners in James Stewart & Co. and moved to Chicago. Mr. Sinks was manager of the grain elevator department of Stewart & Co. from 1905 to the present time.

Q. 24. Can you identify the apparatus of Defendants' Blue-Print Exhibit 30?

A. That's a blue-print of the steel spouts made in Barnett & Record's office, Minneapolis, by Otis Getchell, for the Curtis Bay Dock at Baltimore & Ohio Railroad at Baltimore. As I recollect, the blue-print is the same drawing which I checked over at Minneapolis when I first went with Barnett & Record Co.

Q. 25. In how many directions can the coal spout move in this blue-print?

A. The drawing shows a pedestal upon which the spout can revolve at an angle of 180 degrees in a horizontal position, and a hinge about which it could revolve approximately 130 degrees in a vertical position.

Q. 26. Is this 180 degrees swing limited by any of the other parts of this apparatus?

A. Yes, sir, it is limited so that it can hardly swing in a horizontal position at all by the short spout which projects from the hopper or coal bin. It is also limited by interference with the [fol. 574] timber that supports the pedestal pivot.

Q. 27. Why is a limited horizontal swing, shown in this case, sufficient as compared with the half circle swing you have referred to in connection with grain spouts?

A. Grain spouts are much longer and it is necessary to swing them out of the way of the ship's tackle and boom; it's customary to swing them around against the side of the building. In coal and ore spouts, the spouts are much shorter and the usual method of closing the opening from the bin is to raise the spouts into an almost vertical position. Grain spouts have sliding gates to shut the grain off, so the position of the spout is not necessarily a factor in shutting off the grain from the bin.

Q. 28. If you had occasion to swing one of these coal spouts sufficiently to take advantage of the entire 180 degree swing referred to, what would you, as an engineer, do?

A. I would remove the two causes of interference shown in this particular drawing. I would substitute a bracket to support the pedestal pivot instead of using a long timber; and, secondly, I would enlarge the upper part of the spout so as to clear the short spout attached to the coal bin. Another way to accomplish this would be to put a circular bowl on top of the revolving spout, in a manner similar to that used in the Mayo spout for grain.

Q. 29. Could you have made these suggested changes at the time you were with the Barnett & Record Co. had the necessity presented itself?

A. Yes, sir.

Q. 30. You will note that the width of the fixed chute is shown on the blue-print as 4 feet and the width of the pivoted chute as 4 feet 6½ inches. Please state about how far the fixed chute projects [fol. 575] into the pivoted chute and about how much swing it permitted the pivoted chute before it engages the fixed chute.

A. It projects approximately a foot and the horizontal angle that the pivoted section could make, before striking the fixed section, would be approximately an angle of 2½ or 3 inches to a foot.

Q. 31. The interference by the horizontal beam would bear what relation to the angle of the pivoted spout?

A. As far as the interference of the pivoted section with the horizontal beam, I would say it could revolve 60 degrees either direction, or a total of 120 degrees; it would depend on the pitch of the spout or its angle with the horizontal.

Q. 32. Have you ever heard of a patent on wet concrete?

A. Yes, sir, I was shown one several years ago.

Q. 33. I call your attention to an article in the Engineering Record of Feb. 14, 1914, page 177, and Engineering Record of May 16, 1914, page 551, and will ask if the Ney patent referred to therein is the one you were shown?

By Mr. Hood: The question is objected to as wholly irrelevant and immaterial and incompetent. The witness is shown a typewritten paper upon which appear fragmentary alleged extracts from certain alleged publications, the dates of which are many years subsequent to the patent in suit, and the matter of which does not appear to relate in any degree whatever to the subject-matter of the patent in suit. It is presumed that the purpose of this line of examination is to form a basis for the allegation that the Patent Office does not always cite the best references, but if that is the case no proper foundation has been laid for the examination of this witness on the subject. Counsel for plaintiffs protests against the wholly unwarranted padding of the record in this case with such [fol. 576] irrelevant, immaterial and incompetent and secondary matter.

By Mr. Jones: It is understood that plaintiffs' counsel will stipulate the publication of various magazine articles, called to his at-

tention, after he has had an opportunity to examine them. The pertinency of this Ney patent 939,072, Nov. 2, 1909, will appear later.

By Mr. Hood: Attention is called to the fact that the Ney patent 939,072 has not been pleaded and that the date of the application upon which it was issued lacks but a few days of being six months later than the date of the application on which the patent in suit was issued. So far as the supposed stipulation, referred to by counsel for defendants, is concerned, counsel for plaintiffs has no objection to consolidating the record as much as possible, but never has had any intention of blindly agreeing to something he has not seen. The particular copy referred to bears a date long subsequent to the date of the patent in suit, and nothing shown therein can possibly affect the issues of this case—at least when presented in the manner they are now sought to be presented. There is no foundation at present connecting the present witness with the articles referred to. Again, counsel for plaintiffs protests against encumbering the record in this way and at this late time.

A. Well, I cannot definitely state that it was the Ney patent that I saw several years ago. My recollection is that the patent that I saw involved the use of wet concrete, particularly having to do with making concrete so that it could be easily poured or molded.

Q. 34. Was there any discussion about this wet concrete patent you have referred to?

By Mr. Hood: The question is objected to as irrelevant, imma-
[fol. 577] terial, indefinite as it does not identify the alleged "wet concrete" patent, and as apparently referring to occurrences subsequent to the date of the application upon which the patent in suit was issued.

A. The patent caused a good deal of amusement among engineers and contractors, particularly those who were engaged in building grain elevators, because for several years before the patent was issued we had been using wet concrete. I presume the use of wet concrete had been introduced by grain elevator engineers because of the use of narrow walls and sliding forms; it's impossible in building grain elevators' bin walls with sliding forms to use dry concrete, and the wetter the concrete can be mixed the more easily it is handled in construction and the better the finished work will be.

Q. 35. If you are familiar with Defendants' Exhibit 28, George M. Moulton & Company's book or catalogue, please state how long ago, to your knowledge, it was available to the public.

A. I have had a copy of this publication in my book case ever since 1905, at which time James Stewart Company took over the office of the George M. Moulton & Co. in the Fisher Bldg., Chicago. George M. Moulton & Co. had been in the grain elevator business for some years and about 1904 they got into some financial difficulties and went out of business.

Q. 36. Do you know where I obtained this particular copy which is used in evidence?

A. It's a copy that I loaned you.

Q. 37. Please state if you are familiar with the details of a structure such as shown on page 20 of this Exhibit 28.

A. I am.

[fol. 578] Q. 38. About how early did you see grain distributing apparatus of which this may be typical?

A. About 1897, when I first went into the grain elevator construction work.

Q. 39. Have you ever seen apparatus such as shown on page 49, more particularly the pipes or spouts and the supports for them?

A. Yes, I have seen this particular elevator in Buffalo.

Q. 40. Are you familiar with the apparatus illustrated in Webster Mfg. Co.'s catalogue M, Defendants' Exhibit 12, having the name R. H. Folwell on the cover?

A. I am.

Q. 41. How long have the swivels and spouts shown therein been used?

A. Some of them previously to 1900; I don't know how long before that.

Q. 42. Have you ever seen a dredge embodying the general features of Edwards' patent 363,468? If so, please state when and where you saw it.

A. Barnett & Record Co. built a dredge in 1899 that was similar to the cut shown in this catalogue; they used it on dredging and filling work for the Peavey Elevator Company at Duluth.

Q. 43. If this dredge is illustrated in Defendants' Exhibit 15, please point it out.

A. On page 49, the lower right-hand corner, there is an object that looks like the dredge in question.

Q. 44. Explain briefly the operation of the device projecting from the right-hand side of the cut, page XI of this Exhibit 15.

A. The apparatus you refer to is what is known as the marine leg pusher and consists of a vertical screw with a nut traversing the screw; to the nut is attached one end of a steel strut, on the outer end of which is a roller, upon which the marine leg rests. From [fol. 579] the roller there is a tie rod extending to a fixed pivot on the side of the marine tower. The screw is driven by a reversible bevel gear or motor. When the nut goes up or down, the marine leg is pushed out or in as required. I installed the first apparatus of this type in the Great Northern elevator in Buffalo in 1898, and the draftsman who was employed on that work, named Greenberg, and another named Hahn took out a patent on the apparatus.

Q. 45. Prior to 1905, were there any grain spout swivel connections available to the public other than those shown on the blue prints you have examined this morning?

A. The Mayo and the Robinson patent, the Parker and the Bird.

Q. 46. Do you use chutes supported from booms on a tower in your present construction work?

A. I haven't used any revolving chutes; I used fixed chutes. In constructing grain elevators with sliding forms, we build a platform over the top of the form which is raised by a jack. A tower, of

generally wooden construction, is erected at a convenient place beside the work and the concrete is hoisted to the top of the tower in skip buckets; up into a hopper that is arranged to move upwards on the tower by means of tackle or chain hoist. At the bottom of this hopper we have a gate with a short spout for filling wheel carts.

Q. 47. How long have you been using this apparatus?

A. I believe we first used in on the Canadian Pacific elevator at Port Arthur in 1903. We first used it in the United States in 1905 on American Malting Co.'s elevator at Buffalo.

Direct examination closed.

By Mr. Hood: Counsel for plaintiffs moves to strike the entire deposition from the record as irrelevant and immaterial, and on the further ground that the same has not been taken in accordance with [fol. 580] the Equity Rules for reasons set forth at the beginning of the deposition. Therefore Counsel for plaintiffs here moves that defendants be required to pay the plaintiffs the entire costs involved in attendance at this session, owing to the character and manner of taking the deposition.

By Mr. Jones: Defendants' counsel will present at such time, as a counter-claim, the cost of two unnecessary trips East in conjunction with the preliminary injunction hearing, first set in August, 1920, and then indefinitely postponed and set again in November, 1920, and resulting in the acceptance by plaintiffs of a bond from defendants, suggested by the court, without giving defendants a hearing on the merits after they were fully prepared for both hearings with affidavits from parties scattered from the Atlantic to the Pacific.

No cross-examination.
Deposition closed.
Recess.

Robert H. Hughes, a witness produced on behalf of the defendants, being first duly sworn, testified as follows:

Examination by Mr. Jones:

Q. 1. What is your name, age residence and occupation?

A. Robert H. Hughes; 5000 Kenmore Avenue, Chicago, Ill.; age, forty; occupation, carpenter by trade; building superintendent at present.

By Mr. Hood: Counsel for plaintiffs objects to the examination of this witness, except in surrebuttal, on the ground that the time [fol. 581] within which it was agreed that depositions on behalf of the defendants might be adduced has expired, and in accordance with said agreement plaintiffs have begun the taking of depositions in rebuttal. Further depositions on behalf of defendants in direct defense are therefore improper without special permission of the court or without consent of plaintiffs.

Q. 2. Where were you employed in 1907 and 1908?
A. St. Louis.
Q. 3. By whom were you employed at that time?
A. Gilsonite Construction Company.
Q. 4. On what buildings were you employed?
A. American Theater and the colored high school, and a whole lot of jobs.
Q. 5. If either of these buildings involved the use of concrete, state what kind of apparatus was used for placing the concrete.

By Mr. Hood: In so far as the question relates to the colored high school, it is objected to as not properly pleaded.

A. What we call spouting chutes.
Q. 6. Was spouting used on both buildings?

By Mr. Hood: Objection repeated.

A. On both buildings.
Q. 7. Who had charge of the spouting on the American Theater Building?
A. A man by the name of Herman Bankes was superintendent and the assistant who had charge of the actual operation of it was named William Best.
Q. 8. Can you make a sketch of the apparatus used on the colored high school?
A. Yes, I have done so.

By Mr. Hood: The answer and sketch are objected to on the [fol. 582] ground that the matter has not been properly pleaded.
By Mr. Jones: The sketch is marked Defendants' Exhibit 53, Hughes' Sketch of 1908 High School.

Q. 9. Please describe this apparatus.

By Mr. Hood: Question objected to as relating to matter not properly pleaded, and it is agreed that this objection will be considered as entered to all questions and answers relating to the same subject-matter.

A. It consisted of a tower about 150 ft., guyed with ¾-inch cables; chutes were suspended from cables at each section-point running down to a tripod; a hopper was placed at top of tower; concrete was delivered into the hopper by a skip. The chutes are suspended from the cable by a block and fall; these chutes run down to within about 20 ft. of the floor, and then it intersects in through another chute resting on a tripod, which carries it down to the floor and it is distributed around over the floor level.
Q. 10. Whose idea was this apparatus?
A. I suppose that was the superintendent's idea; he is the man who generally lays out his plan; William Best was the superintendent.
Q. 11. You mean on this colored high school?
A. Yes.

Q. 12. What part did you have in getting up this work?

A. My work was in building tower and placing chutes, and looking after equipment in general.

Q. 13. Was this outfit the same as that on the American Theater Building?

A. No, sir; it was with some exceptions.

Q. 14. Wherein was the American Theater Building different?

[fol. 583] A. The chute was resting on a steel structure instead of being suspended from the cable.

Q. 15. When you wished to change the direction of these chutes on the colored high school, how would you do it?

A. When we couldn't reach it with the lower chute, we would change our line of chute from the tower, hang them on a different cable, another cable.

Q. 16. Through how wide an angle could you direct them in this manner?

A. Oh, 50 feet.

Q. 17. How much of the floor area could you reach with your line of chute on different cables?

By Mr. Hood: Question is objected to as calling for an opinion and not for facts.

A. I can't answer that question with this one, but I can with this one. (Witness points to upper chute, then to lower chute.)

Q. 18. Answer it any way you wish.

A. I would say an area of 50 ft. square.

Q. 19. You mean a 50 ft. area with one setting of the line?

A. Yes.

Q 20. If your main line projected in one direction from the tower, and at a later period, as you state, it swung around and hung from another cable, what was the maximum angle between these cables?

By Mr. Hood: Question objected to as assuming matters not proven or testified to by the witness.

A. I don't know if I get that question or not.

Q. 21. I make a plan view of the tower with a line of chuting running out from it at right angles. Please indicate on this paper how far you could move your line of chuting either to the left or right of that line and still connect to the hopper.

[fol. 584] A. What do you mean—at this point? (Witness points to the top of the tripod indicated in Defendants' Exhibit 53.)

Q. 22. Please draw a line on this sketch showing some one other position of the line of chuting besides the one that I have drawn.

(Witness draws four radial lines from the four corners of the the tower.)

Q. 23. You mean by this that the chute would be connected to any of these four lines, including a swing of about three-fourths of a circle.

By Mr. Hood: Objected to as leading.

A. Yes.
Q. 24. How many lines of chuting did you use at one time?
A. One.
Q. 25. Did you ever use more than one?
A. No.
Q. 26. You never hung two lines of chutes from two different cables at the same time?
A. No.
Q. 27. What was the arrangement whereby the upper end of the main line of chutes connected with the hopper in these different radial positions of the supporting guy lines?

By Mr. Hood: Objected to as assuming facts not stated by the witness.

A. I don't know if I've got that question clear enough.
Q. 28. Explain the section which you have marked B in the sketch.
A. Let me ask you one, then I'll get it right. Do you want to know how section B is supported at the mouth of the hopper? Is that it?
Q. 29. Yes.
[fol. 585] A. It's either wired up or hung by rope.
Q. 30. Section A indicates a trough-shaped section. Of what material was this chute made?
A. Light, gauge metal iron.
Q. 31. Where was the tower with reference to the school building?
A. Outside center of the building.
Q. 32. As I recall it, you stated to me, in explaining this rig before this deposition started, that you used two lines of chutes on this building. Is that a fact or did I misunderstand you?

By Mr. Hood: The question is objected to as an attempt to lead the witness, and an attempt on the part of counsel for the defendant to testify and not under oath.

A. You must have misunderstood me, because you couldn't feed two chutes from one hopper.
Q. 33. How was the position of the lower section of chute changed?

By Mr. Hood: Objected to as assuming a fact not stated by the witness.

A. By lifting it up and moving it around.
Q. 34. About when did you first use this apparatus on the colored high school?
A. Spring of 1908.
Q. 35. How do you fix that time?
A. By figuring back on other jobs I was on.
Q. 36. How long were you on the American Theater job?
A. Six months.

Q. 37. What year?
A. 1907.
Q. 38. Did you see the St. Louis Coliseum under construction?
[fol. 586] A. Didn't observe it very close.
Q. 39. What year was the Coliseum built?
A. 1908 or 1909, to the best of my recollection.
Q. 40. Were you on any jobs between the American Theater Building and the colored high school?
A. No, sir.
Q. 41. Did you go directly from one to the other?
A. Yes, sir.
Q. 42. About how long was this apparatus used on the colored high school?
A. About six to eight months.
Q. 43. Does your sketch accurately indicate the construction of the upper end of the chute at the bottom of the hopper?
A. It doesn't show it as plain as section B.
Q. 44. Did the upper end of the chute receive concrete from the hopper in any of the different positions in which the line of chuting might be hung from the different cables you have referred to?
A. Yes, sir.
Q. 45. About how long was the main line of chutes?
A. Different lengths, according to where we were pouring at the time.

By Mr. Jones: That is all.
By Mr. Hood: Counsel for plaintiffs moves to strike the entire deposition as irrelevant and immaterial and for the further reasons set forth in the motion to strike the depositions of Bannister, Folwell and Fucik.

Cross-Examination by Mr. Hood without waiving objections:

X Q. 46. What is the precise location of the colored high school to which you have referred?
A. That I can't answer—east of Taylor Avenue.
[fol. 587] X Q. 47. Is it north of Washington St. or south?
A. North of Washington.
X Q. 48. About how far?
A. Two miles.
X Q. 49. And about how far east of Taylor Avenue?
A. Two blocks.
X Q. 50. Is it north of North Market St?
A. It's been so long I have lost track of the streets.
X Q. 51. What was the height of the building—how many stories?
A. Two stories.
X Q. 52. And what was its width and length?
A. The building was an E-shape, about 100 feet at each end by 400 feet long.
X Q. 53. And the tower was placed at about the middle of the main stem of the E, the 400 foot length, and on the outside of the building, was it?

A. Yes, sir.

X Q. 54. For what purpose did you suspend the first chute sections from the guy wires X and Y, which I have indicated on the sketch Mr. Jones made for you, and upon which you placed four diagonal lines?

A. The chutes wasn't suspended from any of the cables running back from the building.

X Q. 55. They you didn't shift the first chute sections from one position to another through as much as three-quarters of a circle, as indicated in Q. 23 and your answer to it, did you?

A. They could be but they wasn't in this particular case.

X Q. 56. Now, as I understand it, this building had a floor plan in the shape of an E, the main stem of the E being about 400 feet long and the upper and lower ends of the E being about 100 feet long; is that right?

A. Approximately.

[fol. 588] X Q. 57. And how wide were these building sections?

A. That was about 54 feet.

X Q. 58. How much concrete was placed in this building by the apparatus you have illustrated in Exhibit 53?

A. I don't know.

X Q. 59. Was it a reinforced concrete building?

A. Yes.

X Q. 60. Was all of the concrete of the foundation placed with this apparatus?

A. Yes.

X Q. 61. The frame of the building was reinforced concrete, was it—the columns?

A. Yes.

X Q. 62. Were the columns and first and second story floor slabs placed with this apparatus?

A. Yes, sir.

X Q. 63. Was there a reinforced concrete roof slab?

A. Yes, sir.

X Q. 64. And was the concrete of the roof slab placed with this apparatus?

A. Yes, sir.

X Q. 65. About what was the height of the roof slab from the ground?

A. About 50 feet.

X Q. 66. Who was the contractor on this job?

A. Gilsonite Construction Company, on the superstructure.

X Q. 67. Did the Gilsonite Construction Company place all the concrete?

A. Yes, sir.

X Q. 68. Was there a fellow named Fount M. Woodward on that job?

A. Not with the Gilsonite people.

X Q. 69. Please give the names and residences of such men as you now recall who worked on this job with you.

[fol. 589] A. I can't do that.

X Q. 70. Was there a man named Henry L. Webb worked on that job?

A. I don't recall whether he worked on this particular job but he was employed by the Gilsonite people at the time.

X Q. 71. You are depending on your memory as to the time when you say this apparatus was used on the colored high school, are you?

A. Depending on my memory? Yes, sir.

X Q. 72. And you don't remember what sort of apparatus was used in building the Coliseum at St. Louis?

A. No, I don't.

X Q. 73. You saw that job in course of construction, didn't you?

A. Saw it passing by, yes, sir.

X Q. 74. About how many times did you pass by the Coliseum while it was being built?

A. Quite a number of times, I don't know the exact number.

X Q. 75. Who was the architect on the colored high school job, do you know?

A. I don't recall.

X Q. 76. In what month did you begin the use of this apparatus you have described, on the colored high school?

A. March or April.

X Q. 77. You are not sure which?

A. No, sir.

X Q. 78. Might it have been as late as May?

A. Possibly.

X Q. 79. It might even have been as late as June, mightn't it?

A. No.

X Q. 80. When were you first consulted by Mr. Jones or anybody else as to your recollection about this apparatus used on the colored high school?

[fol. 590] A. First of February last.

X Q. 81. By whom?

A. By Mr. Jones.

X Q. 82. State briefly the circumstances which caused that interview.

A. It came through meeting Mr. Woodward on the street before Christmas, telling me that he was up in an attorney's office giving his deposition about the concrete equipment on the American Theater; so shortly after I received a letter from Mr. Jones asking me to come in.

X Q. 83. In shifting this first line of chutes from the hopper in the colored high school job, did you shift the guy line or did you separate the blocks and falls for the chutes from one guy line of the tower to another guy line of the tower?

A. We disassembled from one guy wire immediately to another.

X Q. 84. How many guy lines were there on the job?

A. There was probably six or eight, running across the building.

X Q. 85. That is, running across the building from the tower

and fastened at their lowest ends to some sort of a support secured in or to the ground?

A. Yes, sir.

X Q. 86. Well, to what did you fasten these different guy lines to the ground?

A. To a dead man.

X Q. 87. And about how far from the building were these dead men?

A. Far enough so that they cleared the building as it went up.

X Q. 88. That is, they were originally placed far enough away from the building so that the guy lines attached to them and attached to the top of the tower would clear the top of the building when it was done?

A. In some cases it would.

[fol. 591] X Q. 89. What was the condition in the other cases?

A. We would let them go through the floor and box around them and take them out afterwards.

X Q. 90. Did you suspend any of the chute sections from these guy wires which you say had to be boxed in or boxed around?

A. Yes, sir.

X Q. 91. For what part of the work did you suspend the chute sections from these guy lines?

A. Why, when we would build a floor up until it hit that cable we would let it remain in the same position, box around the cable at that floor, so we could remove it after the building was up.

X Q. 92. Well, what part of the concrete did you place by means of chutes suspended from the guy lines which you say were, in the course of time, boxed in, boxed around?

A. The concrete in the floor.

X Q. 93. The floors through which the cable passed?

A. Yes.

X Q. 94. I don't suppose you remember the name of the inspector for the school board that was on that job, do you?

A. I think it was Bob Wall.

By Mr. Hood: That's all.

Redirect examination by Mr. Jones:

R. D. Q. 95. Explain a little more fully how you placed concrete in a floor by means of chutes hung from a cable passing diagonally through that particular floor.

A. Why, that cable was at a position when the concrete of the first floor that it would clear it and be in a floor slab on the second floor.

R. D. Q. 96. And when you concreted the second floor, you didn't hang the chutes from the same cable, did you?

[fol. 592] A. Yes, sir.

R. D. Q. 97. How were you able to reach the area beyond where the cable went through the floor?

A. By moving our sections that rested on the tripod up close to the tower.

R. D. Q. 98. So the tripod section was long enough to reach to the edge of the floor slab, is that it?

A. Yes, you could lengthen out your section that rests on the tripod to reach the outer area.

R. D. Q. 99. How would you lengthen it?

A. Add another section on it.

R. D. Q. 100. You explained to Mr. Hood that on this job you did not actually hang the main line of chutes from radiating cables representing three-quarters of a circle. About what part of a circle was represented by the extreme outside cables?

A. (The witness indicates on the sketch an angle of about a quarter of a circle.)

R. D. Q. 101. Do you recall a tower in connection with the Coliseum structure?

A. No, I don't recall any of the equipment.

R. D. Q. 102. Is the Gilsonite Company still in business?

A. Yes, sir.

R. D. Q. 103. Do you know the address of William Best?

A. I do not.

R. D. Q. 104. Have you used chutes of this character on any building since 1908?

A. Yes, sir.

R. D. Q. 105. About how often?

A. Oh, ten or fifteen times since 1908.

Deposition closed.

Adjourned to meet tomorrow morning, April 5th, at the Fargo [fol. 593] Engineering Company's office, 212 West Courtland Street, Jackson, Michigan, with the understanding that if the examination of the witnesses cannot be completed in time for counsel for plaintiffs to reach Detroit in time to leave there for Indianapolis that night, counsel for plaintiffs shall have opportunity, if he desires, to cross-examine at a later date.

Met pursuant to adjournment at 9:35 a. m., April 5, 1921, at the office of Fargo Engineering Company, 212 West Cortland Street, Jackson, Michigan.

Present: Mr. Arthur M. Hood, for the plaintiffs, and Mr. M. F. Cargill, for the defendants.

WILLIAM G. FARGO, a witness for and on behalf of the defendants, being first duly sworn, testifies as follows, in answer to questions by Mr. Cargill:

By Mr. Hood, counsel for plaintiffs, objects to the examination of this witness, except in surrebuttal, for the reasons fully set forth in connection with the examination of the witnesses Bannister, Folwell, Fucik and Hughes.

Q. 1. Please state your name, age, occupation and residence.

A. William G. Fargo; age 53 years; residence, Jackson, Michigan; business, civil engineer.

Q. 2. When did you first hear of the suit of the Concrete Appliances Company v. Gomery et al.?

A. In the early part of March, this year.

Q. 3. Through whom did you hear of this suit?

A. Through the law firm of Sheridan, Jones, Sheridan & Smith, Chicago.

Q. 4. Did you receive a letter from Mr. Jones, dated October, 1920, regarding the early use of certain concrete spouting apparatus?

[fol. 594] A. Never received this letter.

Q. 5. Assuming one was written, how do you account for your failure to receive it?

Objected to by Mr. Hood as immaterial.

A. From the copy of the letter received recently, it appears to have been wrongly addressed.

Q. 6. Did you ever have offices at the address to which the letter was sent?

Objected to as assuming.

A. The letter was addressed apparently to 118 East Main St., which location we left in 1906.

Q. 7. In what business were you engaged in the years 1905, 1906, 1907?

A. The general power plant engineering business.

Q. 8. Were you connected in any manner with the building of the Webber dam near Lyons, Michigan?

A. I was designing and supervising engineer. The work being done on force account, and I had charge of ordering materials and equipment for the owner, the Commonwealth Power Company.

Q. 9. Of what material was this dam constructed?

A. Of concrete.

Q. 10. By what means was the concrete placed on this job?

A. Concrete was mostly conveyed by small tip-cars from the mixer to the forms, and was placed in the forms mostly through chutes or spouts. The car ran along a trestle on the sides of which metal hoppers were placed, from which the spouting led the concrete to the forms.

Q. 11. If you were in a position to know, what was the general practice about 1905 and 1906, relative to the amount of water used in the concrete batch?

A. We were just beginning to use concrete mixed wet enough to be deposited by means of spouting.

[fol. 595] Q. 12. I hand you a photograph and ask you to state generally the process of handling the concrete by the apparatus shown there.

A. In this photograph there are no hoppers of the form usually adopted, and the concrete being dumped into the boxes, which served as hoppers, was pushed into the spouts leading from boxes—later

hoppers were substituted. This photograph shows some of the first concrete being placed at Webber dam.

Mr. Cargill: The notary is requested to mark the photograph Defendants' Exhibit No. 54, Webber Dam, 1906.

By Mr. Hood: Photograph is objected to as not properly proven.

Q. 13. Who took the picture?

A. I think the picture was taken by H. S. Hunt, who was resident engineer at Webber dam, and who is now a member of the Fargo Engineering Company.

Q. 14. When was the picture taken? Give the approximate date.

Mr. Hood: Objected to as incompetent in view of the previous answer of the witness.

A. I made weekly trips to the Webber job, and I know from the stage of construction shown that the photograph was taken in the early summer of 1906.

Q. 15. About how long were the chutes shown in the picture marked Defendants' Exhibit 54?

A. Approximately 40 feet.

Q. 16. How were the chutes supported?

A. By timber framing and by wires or cables.

Q. 17. Were the chutes so constructed that the place of the delivery of the concrete could be varied as desired?

A. They were.

[fol. 596] Q. 18. I hand you another photograph and ask you to identify the same.

A This is a photograph also taken by H. S. Hunt at Webber dam in the summer of 1906.

Q. 19. Kindly describe the operation of the apparatus shown.

A. This photograph shows concrete being deposited through metal hoppers and spouting, the latter supported principally by cables, and being so attached to the hopper outlets as to permit of swinging around this point of attachment as a center.

Mr. Cargill: The notary is requested to mark this photograph Defendants' Exhibit No. 55, Webber Dam.

Q. 20. Please describe more in detail the means whereby the chute could be swung from side to side as stated.

A. The sections of the spouting were fastened together by means of lugs and short pieces of chain at each joint. The top section of pipe had a swivel connection, in some cases, to the hopper outlet. The swivel connection consisted of a flange either on the hopper outlet, or on the end of the pipe, engaging which were lugs attached to the opposite member. Other connections were by lugs and chain or lugs and bolts, the latter requiring removal of the bolts to operate the swivel.

Q. 21. Through how large an arc could the lower ends of the chutes be swung by means of the swivel connection just described?

A. The flange and lug swivel permitted the complete circle of

movement, except as restricted by the trestle or other supporting timbers.

Q. 22. How are the chutes supported in the picture marked Defendants' Exhibit 55?

A. The load of the chutes was carried principally on the hopper, [fol. 597] but there were one, and sometimes two, cables, from which the sections of the chutes were supported at the joints, and the lower end of the chute in this picture rested upon a concrete wall previously built.

Q. 23. I hand you another picture and ask if you can identify the apparatus and the job shown there.

A. This is a photograph of the upstream side of the bear-trap gate section of Webber dam, taken during construction, and showing the concrete being deposited through wooden hoppers and chutes. These were used because of the lack of metal equipment for the entire work.

Mr. Cargill: I will ask the notary to mark this picture as Defendants' Exhibit No. 56, Webber Dam.

Q. 24. Are the metal chutes, shown in the last picture produced, movable or are they stationary?

A. It was movable.

Q. 25. Describe the feature of their construction which permits this movement.

A. The one metal chute shown has the same essential features as described in the previous exhibit.

Q. 26. Referring to Defendants' Exhibits Nos. 54, 55 and 56, have you seen the same prior to today? If so, where?

A. Yes. We have the originals in our Webber dam files.

Q. 26a. You stated in a previous answer that you had charge of the purchasing of supplies or apparatus used on the Webber dam. From whom were these metal spouts purchased?

A. From Jarvis Engine and Machine Works, Lansing, Michigan, they being made up to order, from our sketching.

Q. 27. Did it ever occur to you, prior to 1908, that it would be [fol. 598] practical to use grain chutes having flexible sections and a swivel attachment near the top, for the purpose of placing concrete? If so, kindly state the particulars.

Mr. Hood: Objected to as grossly leading.

A. Yes. When we made the preliminary inquiry to Jarvis Engine and Machine Works, June 13, 1906, we referred, for description, to the grain chutes shown in H. Channon & Co.'s Catalogue No. 14, page 463. (Witness produces a press copy book and examines the impression of a letter of June 13, 1906, therein.)

Q. 28. What features of this chute referred to in the H. Channon Catalogue impressed you as being adapted for use in concrete work?

A. Its flexibility.

Q. 29. The witness is handed Defendants' Exhibit No. 12, Webster Mfg. Company's catalogue, and referred to page 201, and is asked

whether the flexible and swivel chute shown on that page is the substantial equivalent of the one shown on page 463 of the Channon Catalogue No. 14, which is also handed him.

A. They seem to be very much alike.

Q. 30. Witness is handed two blueprints and a typewritten copy of each and requested to identify the same, if he can.

A. These are copies of the original orders of Commonwealth Power Company to Jarvis Engine and Machine Works for concrete spouting and hoppers, dated, respectively, June 21st and July 21st and July 7th, 1906, being signed by this witness for the Commonwealth Power Company.

Mr. Cargill: The notary is requested to mark these blue-prints and the copies thereof Defendants' Exhibits No. 57, Shop Orders to Jarvis Engine and Machine Works.

Q. 31. Was the apparatus afterwards received from the Jarvis [fol. 599] Works and put into practical use?

A. It was.

Q. 32. Where was it used and when?

A. At Webber dam in the summer of 1906, and subsequently on other work for the Commonwealth Power Company.

Q. 33. Are you the William G. Fargo who is stated to be the author of an article entitled "Three Low Head Hydroelectric Developments in Michigan," printed in the Engineering Record of October 19, 1907?

A. I am.

Q. 34. Are you the author of another article, having the same title as the one above, which was printed in the Engineering Record of October 26, 1907?

A. I am.

Q. 35. Are you the William G. Fargo mentioned as being the writer of an article regarding concrete work which was printed May 31, 1906, in the Engineering News, on pages 605 and 606?

A. I am.

Q. 36. Are you the William G. Fargo who is stated to be the author of an article regarding concrete delivery plants, printed in the Michigan Engineer, in Volume 1905-1908, page 144?

Mr. Hood: Objected to as referring to a publication not pleaded.

A. I wrote such an article for the Michigan Engineer about 1905.

Counsel for the plaintiffs is informed that the articles by William G. Fargo, referred to in the four preceding questions, will be introduced in evidence at a later date.

Mr. Hood: Counsel for plaintiffs notes that the alleged article, "Concrete Delivery Plants," referred to by the witness, is not made [fol. 600] available by counsel for defendants to counsel for plaintiffs as a basis for cross-examination of this witness, and therefore objects.

Q. 37. Did you ever hear of the Concrete Appliances Company or

Wm. H. Insley prior to your first intimation regarding this present suit? If so, please state when and the circumstances relating thereto.

A. I don't remember the name of the Concrete Appliances Company. I have known Mr. Wm. H. Insley of Indianapolis for seven or eight years. I became acquainted with Mr. Insley about 1912, and a year or two after this he called on me for information regarding my early use of concrete spouting.

Q. 38. You may state briefly what information you gave him on that occasion.

Mr. Hood: Objected to as immaterial.

A. I gave him some of the same photographs which have been in evidence at this hearing, and other information of like nature.

Direct examination closed.

By Mr. Hood: Counsel for plaintiffs moves to strike the entire deposition from the record, and to tax costs involved in the attendance upon and taking of this deposition, for the reasons stated in the objection entered at the beginning of the deposition.

Cross-examination without waiver of objection:

X Q. 39. In this Webber dam job the mixer was approximately at the ground level and delivered directly into the dump cars, which appear in the Exhibits 55 and 56. Is that correct?

A. The mixer was set approximately on the ground level at the top of the bluff. From this point a level on the trestle extended [fol. 601] over the top of the dam, the concrete not being elevated.

X Q. 40. In that Webber dam job did the hoppers, at the upper ends of the chutes, have any controlling gates for controlling the flow of the concrete from the hoppers?

A. Most of them did not have controlling gates. Some of the hopper boxes, as shown in Exhibit 55, were fitted with gates.

X Q. 41. Were the metal hoppers shown in Exhibit 56 fitted with gates?

A. I don't think they were.

X Q. 42. Were the wooden hoppers shown in Exhibit 56 fitted with gates?

A. I am unable to say whether they were or not.

X Q. 43. In Exhibit 55 there appear to be two wires attached to opposite sides to each chute at or near its lower end, and these wires appear to be led back and up, diverging from the line of the chute, and attached to the trestle. Is that a correct description of construction shown in Exhibit 56?

A. It is a correct, but not a complete one, as there were usually wires connected from these main cables to the joints of the chute.

X Q. 44. Do you mean that in addition to the diverging wires which I have described, and which appear plainly in the photograph, there were also, generally, catenary suspension wires from these main diverging wires, to the chute at the joints between sections?

A. Yes, but not necessarily at all joints.

X Q. 45. In order to swing the chute, was it necessary to release both of the diverging suspension wires and readjust their fastenings?

A. Yes, unless they were attached at their lower ends to a frame or wooden horse which was movable.

[fol. 602] X Q. 46. And in that case their connection with the wooden horse had to be readjusted when you moved the horse?

A. Not necessarily.

X Q. 47. I understand you desire to make a correction as to the relative date of Exhibit No. 54.

A. In answering Question No. 14, I desire to strike out the word "early," referring to summer.

Deposition closed.

Subject to the objections heretofore entered, it is stipulated that if Horace S. Hunt were called and examined as a witness on behalf of defendants, he would testify that he is vice president of the Fargo Engineering Company, and in 1906 was resident engineer in charge of the building of the Webber dam referred to by William G. Fargo, in his testimony, and that the facts stated by the said William G. Fargo, in direct and cross-examination, relative to the construction of the Webber dam and the apparatus used therein, are true and correct.

By Mr. Hood: In the absence of principal counsel for defendants, counsel for plaintiffs, before proceeding with rebuttal depositions, calls upon counsel for defendants for a formal notice, in accordance with agreement, that depositions on behalf of defendants in direct defense are complete.

[fol. 603] [Title omitted]

Depositions of witnesses on behalf of defendants, in accordance with notice and agreement, before Raymond S. Taylor, acting as Special examiner by agreement, at the office of Westervelt & Ball, 522-525 Citizens National Bank building, Los Angeles, California, on the 28th day of April, 1921, at 10 o'clock in the forenoon.

Present: George P. Barton, Esq., for defendants; Frederick S. Lyon, Esq., for plaintiffs.

Mr. Lyon: I appear here on behalf of plaintiffs without waiving any and all objections which may be had or taken to the taking of any deposition on behalf of defendants. I have no knowledge as to whether the taking of depositions on behalf of defendants is authorized, and have agreed to attend the taking of these depositions with the understanding that the solicitor of record for plaintiffs may urge to the court any and all objections which may be had or taken to the taking of these depositions, my appearance not to be considered as in any manner authorizing their taking, except that to accommodate defendants, notice of the time and place has

been waived by me subject to such and all objections which may be had or taken to the taking of any depositions whatever.

[fol. 604] THEODORE EMTMAN, the first witness, being duly sworn, and examined as witness in behalf of defendants, testifies in response to questions of counsel, as follows:

By Mr. Barton:

Q. 1. Please state your name, age, residence and occupation.
A. Theodore Emtman; 617 West Fortieth Place, Los Angeles; fifty-three; occupation, contractor.
Q. 2. What was your business in 1906, '07 and '08?
A. As near as I can remember, I was superintendent for the F. O. Engstrum Company.
Q. 3. I show you some photographs marked Defendants' Exhibit 44, A, B, C, D, Majestic Theater. Will you look upon those photographs and state whether you remember any work being done which corresponds to what is shown in those photographs?

Mr. Lyon: Objected to as incompetent, no foundation laid, the witness not being qualified to answer such question, it not being shown that the witness has any knowledge of such photographs and as leading and suggestive.

A. I never saw those photographs before to my knowledge.
Q. 4. State if you know whether the F. O. Engstrum Company had to do with any work connected with the erection of the Majestic Theater Building in Los Angeles, and if so, about what time?
A. To my knowledge they were general contractors. I do not remember the time.
Q. 5. Do you mean they were contractors for the Majestic Theater Building?
A. Yes.
Q. 6. Was that work done while you were superintendent of the Engstrum Company?
[fol. 605] A. Yes.
Q. 7. According to your best recollection, what was the year in which that work was commenced?
A. I do not remember at all.
Q. 8. You recall, do you, when you began working for the Engstrum Company—the year?
A. About 1894, I think.
Q. 9. How old were you then?
A. I do not remember.
Q. 10. What was the first work you did for the Engstrum Company, that you did?
A. Building.
Q. 11. What?
A. I do not remember.
Q. 12. Are you acquainted with Lee Callahan?
A. I am.

Q. 13. How long after you began working for the Engstrum Company did you become acquainted with Mr. Callahan?

A. I do not remember.

Q. 14. State approximately. One year after, or five or ten?

Mr. Lyon: Objected to as incompetent, calling for a mere guess by the witness, witness having already stated that he has no recollection.

A. I got acquainted with Callahan after 1900.

Q. 15. Where?

A. Could not tell, don't remember.

Q. 16. Are you acquainted with Mr. H. W. Bryson, who is now present in the room?

A. I am.

Q. 17. Did you know him in 1894, when you began working for F. O. Engstrum Company?

A. I did not.

Q. 18. Did you see the progress of the work while it was going [fol. 606] on in the erection of the Majestic Theater?

A. I did part of the time.

Q. 19. And was Mr. Bryson taking part in superintending that work?

A. Mr. Bryson is the general manager of the F. O. Engstrum Company.

Q. 20. Did you yourself act under Mr. Bryson at that time?

A. I did.

Q. 21. And did you give any directions or advice to him or to others in connection with the Majestic Theater work?

Mr. Lyon: Objected to as incompetent, as calling for a conclusion of the witness and not for a statement of fact.

A. Do not remember.

Q. 22. At the time that work was going on, did you know K. O. Wetzel?

A. I did not know K. O. Wetzel at that time, to my best knowledge.

Q. 23. When did you first know him?

A. Do not remember.

Q. 24. When I ask as to dates from you, you will understand that I do not expect you to remember, in all cases, the actual day or hour, so I will modify the last question, with this explanation, asking you to answer it approximately.

A. I do not even remember the year.

Q. 25. You are still associated in business with Mr. Bryson, are you not?

A. Only a business acquaintance.

Q. 26. Do you remember Swan P. Johnson?

A. I know him.

Q. 27. When did you first know him and in what connection? [fol. 607] A. I do not remember.

Q. 28. Did you ever talk with Swan P. Johnson about any im-

provements that you thought you had made in concrete construction or in distributing concrete in the erection of buildings?

Mr. Lyon: Objected to as incompetent, irrelevant and immaterial, and inadmissible under the pleadings, and as not binding in any manner upon the plaintiffs, unless it is shown that such conversation was in the presence of the officers, and representatives of the plaintiffs or some of them.

A. Don't remember.

Q. 29. Did you ever talk with Lee Callahan about any such improvements?

A. I do not remember.

Q. 30. Do you say that you do not remember anything about any such talk about improvements in concrete construction that you had either with Mr. Callahan or with Swan P. Johnson?

Mr. Lyon: Same objection as last noted on the record.

A. Do not remember.

Q. 31. Nor with K. O. Wetzel?

Mr. Lyon: Some objection as nast noted on the record.

A. Do not remember at the present time.

Q. 32. You recall, do you not, that Wetzel and Callahan were both working for F. O. Engstrum Company at the same time you were working for the Company, do you not?

Mr. Lyon: Objected to as leading and suggestive.

By Mr. Barton: It is apparent that this witness is called for [fol. 608] defendants and has appeared, though his associations and interests, I infer, are with the plaintiffs. This may be taken as an apology, if apology is necessary, for putting what might be considered otherwise leading questions.

Mr. Lyon: The statement counsel objected to is not evidence, and motion is made to strike it from the record and exclude it from consideration upon this ground and upon the further ground that it is not made under oath and is incompetent, no foundation laid. The fact stated by counsel is denied by plaintiffs. The witness has no connection whatever with the plaintiffs, and has appeared here voluntarily. The present counsel has talked with him before putting him on the stand, and plaintiffs insist that any attempted proof be produced strictly in accordance with the rules of evidence. Whatever inferences counsel may assert, certainly are not justified by the testimony of the witnesses, and the witness here gives every indication of being perfectly willing to answer fully so far as his recollection will enable him to do so, any competent question of counsel. Plaintiffs therefore insist that the deposition be conducted according to the rules of evidence.

A. I do; they were.

Q. 33. What was the approximate date?

A. Do not remember.

Q. 34. Do you remember if, during that time, you were by yourself or in association with others working out improvements in the distribution of concrete?

Mr. Lyon: Objected to as incompetent and as assuming facts not testified to by the witness and as leading and suggestive.

A. I do not.

Q. 35. Do you recall having an interference in the United States [fol. 609] Patent Office, an application of yours being involved with one of Lee Callahan's relating to material transferred in apparatus?

A. I do not remember about it.

Q. 36. I show you a Patent Office copy of letters patent No. 948,723, dated February 8th, 1910, to Theodore Emtman, assignor, to Concrete Appliance Company, of St. Louis, Missouri. I call your attention to the drawing of said patent especially. I will ask you if you are the Theodore Emtman mentioned in that patent?

A. I am.

Q. 37. I also call your attention to the Patent Office copy of letters patent No. 948,719, dated February 8th, 1910, to Lee Callahan, assignor to Concrete Appliances Company, of St. Louis, Missouri, and I direct your attention particularly to Figure 1 in the drawing of that patent, and ask you if you have any recollection of an interference in the Patent Office between the application for your patent, previously mentioned, and the application for this Lee Callahan patent.

Mr. Lyon: Objected to as leading and suggestive and incompetent, as witness is not qualified to answer the question. There is nothing to show that witness has any knowledge of the patent in question. It is incompetent, irrelevant and immaterial under the pleadings.

A. I do not remember.

Q. 38. Do you remember that you ever had an application for any patent involved in an interference with any application of Lee Callahan's?

Mr. Lyon: Same objection as last noted on the record.

A. It is so long ago that I cannot remember. What is on record will show.

[fol. 610] Q. 39. I have here a paper purporting to be a record. I will ask you to look at it and refresh your recollection by it, and after you have done so, please state if you were involved in an interference with Callahan.

Mr. Lyon: Same objection as last noted on the record.

A. It is nothing that refreshes my memory unless it has got my signature to it.

By Mr. Barton: The paper here referred to, being a certified copy from the United States Patent Office, is offered in evidence and

marked Defendants' Exhibit 58, Certified Copy Emtman Preliminary Statement.

Mr. Lyon: Objected to as incompetent, irrelevant and immaterial and inadmissible under the pleadings and not a part of the deposition of this witness.

Q. 40. I ask you to read Defendant's Exhibit Emtman's Preliminary Statement, which I now show you, and after reading it, state whether you recall any of the facts stated therein.

Mr. Lyon: Objected to as leading and suggestive and not a proper matter to prove.

A. I do not remember any of it. If the records are there, of course it's there.

Q. 41. You have read this preliminary statement carefully, have you?

A. Yes.

Q. 42. Do you believe this preliminary statement was made by you?

Mr. Lyon: Objected to as incompetent, irrelevant and immaterial, and as leading and suggestive.

A. I do not remember.

[fol. 611] Q. 43. The question is as to whether you now believe you made such preliminary statement, not as to whether you remember.

Mr. Lyon: Objected to as leading and incompetent.

A. I do not remember.

Q. 44. Where were you born?

A. In Norway.

Q. 45. When did you come to this country?

A. I don't remember.

Q. 46. About what time? About what year?

A. About 1877, or 1879, I do not know.

Q. 47. Would you say that you did not make the preliminary statement in question?

A. I do not remember.

Q. 48. What is your belief?

Mr. Lyon: Objected to as incompetent.

A. I do not remember.

Q. 49. Did you ever erect apparatus like that shown in the drawing of your patent 948,723?

Mr. Lyon: Objected to as leading and suggestive, and incompetent, calling for a conclusion of the witness, not the best judgment, and inadmissible under the pleadings.

A. Yes, sir. Not exactly according to these lines, but according to the principle.

Q. 50. I show you the drawing Fig. 1 of the Lee Callahan patent

No. 948,719. I will ask you if you ever saw apparatus that was erected according to what is shown in that figure.

Mr. Lyon: Objected to as incompetent and as leading and suggestive.

A. Do not remember ever seeing it.

[fol. 612] Q. 51. Do you note any differences in principle between the apparatus in the drawings of your patent and the apparatus of the drawing of Fig. 1 of the Callahan patent?

Mr. Lyon: Objected to as incompetent, no foundation laid, and upon the further ground that it is not the proper subject of the deposition and no leave has been granted to defendants to take expert testimony by deposition.

A. The drawings ought to show the difference without asking me that question.

Q. 52. In your answer to question 49, you say, referring to apparatus like the drawing of your patent: "Not exactly according to the lines, but according to the principle." What did you mean by that statement?

Mr. Lyon: Objected to upon each of the grounds contained in the objection to the original question.

A. The boom was probably was not built just like that; the rope was probably not attached just like that shown.

Q. 53. What was the structure that you first built according to the drawing of your patent referred to?

Mr. Lyon: Objected to as incompetent, irrelevant and immaterial under the pleadings.

A. I do not understand your question.

Mr. Barton: The drawing of your patent, I understand, was intended to illustrate an actual structure that you built and used. Is that correct?

Mr. Lyon: Objected to as leading and suggestive and as assuming facts not testified to by the witness and as incompetent, irrelevant and immaterial and as inadmissible under the pleadings. This objection will be understood as taken and repeated to each and every question asked and answer given by the witness in respect to any apparatus built by him.

[fol. 613] Mr. Barton: Counsel for defendants agrees to this.

A. Yes.

Q. 54. Where was that actual structure built?

A. I do not remember.

Q. 55. Did you ever see a structure built according to the drawing of the Callahan patent, Fig. 1?

Mr. Lyon: Objected to as incompetent and as leading and suggestive.

A. Not to my memory. I was not in San Diego at the time.

Q. 56. Was such apparatus used or applied in connection in with the Majestic Theater Building?

Mr. Lyon: Objected to as leading and suggestive, calling for a conclusion of the witness and not for a statement of facts.

A. It was.

Q. 57. Go on and describe it.

A. Half way of the building on the south side, ther was partially a tower and a concrete bucket to hoist the concrete up to a hopper and from the hopper distribute the same to pipe. Any more you want?

Q. 58. Were you there?

A. About two or three times.

Q. 59. Did you talk with any one about that?

A. Do not remember?

Q. 60. Did you see Mr. Bryson at that time in connection with it?

A. Do not remember?

Q. 61. Did you have to do with any of the apparatus at that time, with ordering it or designing it?

A. Elsewhere.

Q. 62. Do you mean at the Engstrum shop or some other place?

[fol. 614] A. Some other job.

Q. 63. Do you recall any difficulties with the distribution of the concrete at the Majestic Theater Building?

A. I do not.

Q. 64. What was the apparatus used?

A. I have just described it.

Q. 65. Describe it more in detail.

A. What other details do you want?

Q. 66. Describe so far as you remember.

A. Yes.

Q. 67. Then you have described what you recall?

A. I have described it.

Q. 68. Do you remember the times when you visited the Majestic Theater Building?

A. I do not.

Q. 69. Do you remember the year?

A. I do not.

Q. 70. You said you did not go to San Diego. Did you have to do with building the Elks Building, and did you have to do with building the Christian Science Church at Pasadena?

A. I did.

Q. 71. What were the dates of the work on the Elks Building at Pasadena?

A. Do not remember.

Q. 72. In your preliminary statement, I find the following language:"That deponent conceived the invention set forth in the said declaration of interference during the month of June, 1906." What invention did you refer to?

A. Do not remember.

Q. 73. "That he made a sketch of the invention during the month of October, 1906." What invention did you refer to in that statement?

Mr. Lyon: All of these questions in regard to this purported [fol. 615] statements of the alleged preliminary statements are objected to as assuming facts not testified to by the witness and as leading and suggestive, incompetent and irrelevant and inadmissible under the pleadings, and each of these objections will be understood as taken and repeated to each question answered by the witness without the necessity of hereinafter repeating the same.

A. I don't remember.

Q. 74. Do you recall any such sketch?

A. I don't remember.

Q. 75. I quote further: "That he first explained the invention to others during the month of December, 1906." Do you recall describing the invention in question as thus stated in your preliminary statement?

A. I do not remember.

Q. 76. I am not sure that I understand your answer.

A. I do not remember anything about it now.

Q. 77. There follows the phrase in your preliminary statement, "and again in October, 1907." Do you recall explaining the invention in October, 1907, as stated in your preliminary statement?

A. Don't remember.

Q. 78. Do you believe that you explained the invention to any one in October, 1907?

Mr. Lyon: The further objection is urged to this question that it is incompetent.

A. Do not remember.

Q. 79. The answer is not quite responsive to the question. The preliminary statement says that you explained it again in October, 1907. Now do you at the present time believe that you did explain the invention in October, 1907, as thus stated? It is not a question as to whether you remember the invention, but it is a question as to your present belief.

[fol. 616] Mr. Lyon: The belief of the witness is incompetent.

A. I do not remember at this time.

Q. 80. You have stated that two or three times before. The question is as to whether you believe you explained the invention in October, 1907.

Mr. Lyon: Same objection.

A. What else do you want me to answer, because I do not remember?

Q. 81. This preliminary statement appears to have been signed and sworn to by you the 31st day of July, 1909, and to have been filed in the Patent Office, August 16th, 1909, in matters of inter-

ference No. 30,618, Emtman v. Callahan. By means of this, I am endeavoring to refresh your recollection. I have asked you as to your memory and now I am asking you as to your present belief as to whether the statements which appear to have been made and sworn to at that time were correct. This question I will repeat in substance. That is to say, is it your present belief that you did explain to someone the invention in October, 1907, as appears in that preliminary statement? What is your belief now? Do you believe that you did or you did not?

A. I do not remember. If that thing has got my signature to it, it has got it typewritten.

Q. 82. But if you did make such a preliminary statement, sign and swear to it at that time, do you now believe that the statements thus made were true?

Mr. Lyon: The question is objected to as clearly incompetent. The question assumes facts that do not appear from the record, and whether a witness believes that a record is correct or incorrect is not binding upon the plaintiffs.

A. If it's got my signature to it.

Recess until 2 p. m.

[fol. 617] Q. 84. You are experienced in taking out patents, are you not?

A. I have taken out a few.

Q. 85. Was your application for patent 948,723 involved with an interference with Callahan and one Smith?

A. It was so long ago that I don't remember anything about it.

Q. 86. The patents were all taken out at the same time, and all three of those patents relate to concrete distribution, I think. I show you, to refresh your recollection, patent 948,746 to A. L. Smith.

A. I don't remember anything about the other patent.

Q. 87. I ask you to look upon the drawing, Fig. 1 of the Smith patent, and state whether you have ever seen apparatus built according to that drawing.

Mr. Lyon: Objected to as leading and suggestive, incompetent, irrelevant and immaterial, and inadmissible under the pleadings.

A. According to your Figure 1, to what does Fig. 1 appertain?

Q. 88. It is a part of the specification of the said Smith patent, designed to illustrate the structure that is described in the patent. The specification says: "Fig. 1 is a perspective view of a device embodying my invention." This is the drawing I refer to, and the question is whether you have ever seen a structure that was built in accordance with what is illustrated in the said Figure 1.

A. I have not.

Mr. Lyon: Same objection as before.

Q. 89. I am informed that there was an interference between your application and the Smith application and that you and Callahan

[fol. 618] also conceded priority of invention in that intereference to Arthur L. Smith. One of the issues of the interference, I am informed, was as follows:

"1. In a device for distributing concrete, means for elevating the concrete to a point above the plane of work to be performed; a hopper adapted to receive the concrete so elevated; a primary distributing pipe revolubly mounted beneath the hopper; and a secondary distributing pipe revolubly mounted beneath the mouth of the first-named distributing pipe, substantially as described."

With this description of the issue before you, I will ask you again if you have any recollection of that interference with Smith; that is, between Emtman, Callahan and Smith.

Mr. Lyon: Same objection as last made.

A. I will answer you as before—that I do not remember.

Q. 90. Do you understand what is described by the language of that issue as quoted?

Mr. Lyon: Same objection.

Q. 91. You may read it yourself from the record, if you wish.

A. I understand the language, but I don't remember anything about it.

Q. 92. Did you have any talk with Callahan about making that concession of priority to Smith?

Mr. Lyon: Same objection as last noted on the record.

A. I do not remember.

Q. 93. Have you been paid anything in the way of royalties or otherwise on account of the Smith patent, the Callahan patent, or your own patent?

Mr. Lyon: Objected to as irrevelant and immaterial.

[fol. 619] A. It is a piece of my business that I don't consider anybody else's business.

Q. 94. Did you negotiate with Mr. Callahan as to how much you should receive, or how much he should receive on account of the Callahan patent?

A. I don't remember anything about it.

Q. 95. Did you receive anything for conceding priority to Callahan in the interference you had with Callahan alone, in which your preliminary statement, which has been made an exhibit, was filed?

Mr. Lyon: Objected to as incompetent, irrelevant and immaterial.

A. Same answer as before; it is so long ago that I don't remember nothing of it.

Q. 96. My information is that claims 1, 2, 5 and 13 of the Callahan patent, as issued, were involved in the interference you had with Callahan. To refresh your recollection, I will read one of these claims, as follows:

"5. An apparatus for the purpose described, comprising a tower, a conduit, extending laterally therefrom, a suitably supported, horizontal immovable boom, carrying the conduit; said boom being adjustably connected with the tower and adapted to be arranged at various points in the height thereof; mans for raising platic material to the point desired in the height of the conduit, and means for receiving plastic material from the raising means and conducting same to the conduit; the said receiving and conducting means being adjustable in the direction of the height of the tower."

Do you remember that you conceded priority to Callahan in that interference?

Mr. Lyon: Objected to as irrelevant and immaterial, leading and suggestive.

A. Answer same as before; I do not remember.

Q. 97. Do you remember any negotiations with Callahan about your conceding priority to him?

[fol. 620] A. As before, I do not remember.

Q. 98. Do you remember negotiating with Mr. Bryson as to what you should receive on account of any such concession or interest that the Concrete Appliances Company of St. Louis, Missouri, should have in the Callahan patent when issued?

Mr. Lyon: Objected to as incompetent, irrelevant and immaterial, and as a mere reptition.

A. As before, I do not remember.

Q. 99. Did you receive any stock, or were you a stockholder in the Concrete Appliances Company of St. Louis, Missouri, or did Callahan?

A. I do not know.

Q. 100. Do you not know whether you did yourself, whether you received any stock in that company?

A. You want me to tell the truth and you can take it down. It is none of your business.

Q. 101. Of course, personally, it is none of my business, but possibly the court would like to know. Won't you be so good, then, as to tell the court, and I wouldn't, if I were in your place, say to the court that it is none of the court's business?

Mr. Lyon: Objected to on the ground that the question is incompetent, irrelevant and immaterial.

A. I am very sorry that I do not remember.

Q. 102. I take it that you are an old concrete man, are you not? You know as much about it as most anyone, don't you, in a pratical way?

Mr. Lyon: Objected to as leading and suggestive, incompetent and immaterial and that the object of the question is to lay the way for expert testimony, and the question is unauthorized, as defendants are not authorized to take expert testimony.

A. I am not made out of concrete.

[fol. 621] Q. 103. Now, after your pleasantry, which we all appreciate, will you say whether you consider yourself as one who has, from a practical standpoint, a great deal of experience in the use of concrete?

Mr. Lyon: Same objection as previous question.

A. I have handled quite a bit of concrete.

Q. 104. And was not your special work with the Engstrum Company giving advice and direction in the ways of placing concrete in the construction of buildings?

A. Mr. Bryson and I have conferred quite a bit on the placing of concrete and all other constructions.

Q. 105. And for ten or fifteen years?

A. Do not remember how long.

Q. 106. Do you recall using pipes for distributing concrete, the pipes being supported in various ways, and moved by hand, as occasion might require?

Mr. Lyon: This question is objected to as incompetent and irrelevant, leading and inadmissible under the pleadings.

A. I have.

Q. 107. And did you do the same at the Elks Building?

Mr. Lyon: Same objection.

A. We did that and most every other way during the experimental stage.

Q. 108. Are pipes now used for distributing concrete?

Mr. Lyon: Same objection.

A. Same answer.

Q. 109. How is it in Los Angeles?

A. I have not been looking.

Q. 110. Then you don't know?

A. Not at this time.

Q. 111. Then has your system and the Callahan system as shown [fol. 622] in his patent been unsatisfactory in some cases?

Mr. Lyon: Objected to as leading and suggestive.

A. I do not know.

Q. 112. Are you receiving any royalties or income whatsoever out of the Callahan patent, or your own patent, or the Smith patent?

Mr. Lyon: Objected to as irrelevant and immaterial.

A. I don't think anybody is receiving any royalties on account of such fellows as want to infringe.

Q. 113. So far, then, as you know, people are using the Callahan structure freely without reference to any royalty or contract?

Mr. Lyon: Objected to as leading and suggestive.

A. Something I don't know anything about whatsoever at present.

Q. 114. Do you know any one that is paying royalties for the use of the Callahan patent?

Mr. Lyon: Same objection.

A. You will have to go elsewhere to find out, because I don't know.

Witness dismissed.

THEODORE EMTMAN, being recalled on behalf of defendants, testifies as follows:

By Mr. Barton:

Q. 1. I show you a typewritten paper purporting to be copy of the deposition given by you in a suit in the Superior Court of British Columbia, between Concrete Appliances Company, plaintiff and W. K. Rourke, J. E. McDonald and R. Moncrieff, carrying on business as general contractors under the firm name and style of Rourke, [fol. 623] McDonald & Moncrieff, and the said firm of Rourke, McDonald & Moncrieff and Mussens, Limited, Defendants. This copy is typewritten and consists of some nine pages. I will ask you if you recall that suit and recall giving a deposition in that suit.

Mr. Lyon: Objected to as incompetent and not the proper method of proof, and if for the purpose of impeachment an evident attempt by defendant to impeach own witness. If for any other purpose it is leading and suggestive and can be for no other purpose than to educate the witness for his testimony in this case, and as irrelevant and immaterial.

By Mr. Barton: I wish to disclaim even the thought of attempting to impeach this witness.

Mr. Lyon: The further objection has been urged that as the parties to such suit are not the parties to this suit, any deposition or testimony given in such suit can in no manner bind the parties in this suit.

A. I remember about the suit and remember something about the deposition, but nothing of what was in it. The records will show the questions that was asked me at that time.

Q. 2. I ask you to look over this deposition and state whether you recall the statements made in that copy as statements made by you at the time the deposition was given, which appears to have been on or about the 10th day of December, 1914.

Mr. Lyon: Objected to as leading and suggestive, as incompetent, not the proper method of proof, as immaterial, what testimony the witness gave in said suit, upon each of the grounds stated in the objection to the preceding question, and upon the further grounds

[fol. 624] that the foregoing instrument is uncertified and in no manner proven to be even a true copy of the alleged deposition and in no wise binding upon the plaintiffs to this suit.

A. I am unfortunate enough not to remember anything about what is in this copy.

Q. 3. You have had the copy in your hands and looked it over, have you not?

Mr. Lyon: Same objection.

A. Yes.

Mr. Barton: The typewritten copy is marked for identification "Defendant's Exhibit 60, Typewritten Copy Emtman Deposition of December 10th, 1914, in Vancouver Suit."

Witness dismissed.

Theodore Emtman.

The certificate of the magistrate to the foregoing depositions is hereby waived by counsel.

Commission closed.

April 29, 1921.

Met pursuant to adjournment.

Same parties present.

KURT O. WETZEL, the next witness, being duly sworn, testifies in response to questions of counsel as follows:

By Mr. Barton:

Q. 1. Please state your name, age, residence and occupation.

A. K. O. Wetzel; age, 40; 1221 Avenue 54; manufacturer of architectural and ornamental iron work.

Q. 2. What was your business in 1907, '08, '09 and '10?

A. In 1907 I was engaged in the same business as stated before. In 1908 I was engaged with the F. O. Engstrum Company as super- [fol. 625] intendent at the iron works and machine department, and continued in that position until 1915.

Q. 3. You may state what, if anything, you recall as to the construction of the Majestic Theater Building?

Mr. Lyon: Objected to as incompetent, no foundation laid.

Question withdrawn.

Q. 4. State whether you became acquainted at any time with Mr. Hugh W. Bryson, now present in this room, and if so, about when and in what connection?

A. I became acquainted with Mr. Bryson, according to my recollection, in the year 1906, during which time I was doing work in connection with my business for the F. O. Engstrum Company, and

later Mr. Bryson was general manager over the branch in which I was superintendent.

Q. 5. Are you acquainted with Theodore Emtman?

A. Yes.

Q. 6. And when did you first become acquainted with him?

A. I became acquainted with Mr. Emtman during the year 1905.

Q. 7. And in what connection?

A. In connection with work which I was doing for the F. O. Engstrum Company on building construction, where Mr. Emtman was superintendent.

Q. 8. State if you remember any particular work that was being done about that time by the Engstrum Company with reference to concrete construction.

A. Do you mean in the year 1905?

Q. 9. Yes; and immediately after that, 1906, '07 and on until 1910.

A. I do know that Mr. Emtman has had charge of concrete work on different buildings during these years.

[fol. 626] Q. 10. What were your relations with him, if any, in connection with such work?

A. In the employ of the F. O. Engstrum Company, it was my duty to supply all necessary tools and machinery to carry on such concrete work.

Q. 11. And from whom did you receive directions for furnishing such tools and machinery?

A. It was the custom in that business that we received our instructions from the man who was superintendent on the construction job, and also in general from the office executives.

Q. 12. From whom in particular, if you remember, did you generally receive such instructions or orders?

Mr. Lyon: Objected to as leading and suggestive and assuming a fact not testified to by the witness, as he received orders from someone in the building.

A. I received instructions from Mr. Bryson, from Mr. Emtman, Mr. Snook, Mr. A. B. Johnson, Mr. Swan Johnson—these are men that I largely dealt with in such construction.

Q. 13. I will ask you if during that time you were acquainted with Lee Callahan?

A. Yes.

Q. 14. In what connection?

A. In the same connection as previously stated, by working with them together in the construction of the buildings.

Q. 15. When did you first know Lee Callahan, in connection with what work?

A. I recollect to have met Mr. Callahan first during the year 1908.

Q. 16. In connection with what work?

A. I cannot remember in what relation we had a meeting, but it was in connection with our business.

Q. 17. State whether or not Mr. Callahan ever gave you instruc-

[fol. 627] tions or orders as to machinery or tools you should furnish?

A. Yes; Mr. Callahan also ordered all his tools, machinery and equipment through my department.

Q. 18. At what time?

A. I do not know any particular time when that was. These orders would come in at any time when needed.

Q. 19. State whether or not you talked with Lee Callahan about any inventions or improvements that he claimed to have made in connection with concrete distribution.

Mr. Lyon: Objected to as leading and suggestive and as incompetent, calling for a conclusion of the witness and not a proper method of proof.

A. Mr. Callahan has, at some time, talked with me in a general way of an invention which was involved in some litigation in Canada. Otherwise, I do not recollect that he talked of his invention with me.

Q. 19a. State whether or not you recall his having had a skip or bucket for carrying concrete.

Mr. Lyon: Objected to as leading and suggestive, and as immaterial.

A. Yes; we have received orders at one or two times for the manufacturing of a steel bucket which was called the Callahan bucket, and which I understand was Mr. Callahan's patent.

Q. 20. State whether or not you remember anything about the building of the Majestic Theater Building in Los Angeles.

A. I know no details of the construction of that building, as I had not been connected with the F. O. Engstrum Company during that period, but I have been at the Majestic Building during construction in search for business, at which time I have seen some of the work that was carried on.

[fol. 628] Q. 21. I ask you the same question about the construction of the Elks Building.

Mr. Lyon: Objected to as irrelevant and immaterial.

A. I have been at the Elks Building in the early part of construction, in making some figures for iron work, but later on have not paid any other attention to it.

Q. 22. About what was the date of the erection of the Elks Building?

A. To my knowledge, it was also in the year 1907, closely connected with the construction of the Majestic Theater Building.

Q. 23. I have been informed that the permit for the construction of the Elks Building was taken out in the summer of 1908. I mention this in order that you may state how certain you are as to the date of the construction of the Elks Building.

Mr. Lyon: Objected to as leading and suggestive, and the statement of date is objected to as not evidence in the case. I understood

the witness previous answer to be that according to his recollection, the Elks Building was erected in 1907, and he was simply giving us his best recollection of the fact and not asserting that he had any documentary evidence or memoranda upon which he based that recollection.

A. I do know that the Elks Building was built following the Majestic Theater Building, and I know this for the reason that during this period, when these buildings were more or less in a completed state, I took charge of the position as given before with the Engstrum Company, and that in connection with this I handled part of tools and machinery which were used in that construction.

[fol. 629] Q. 24. I show you some photographs marked "Defendants' Exhibit 44," and will ask you if you recognize them.

Mr. Lyon: Objected to as incompetent; no foundation laid.

A. I can only with safety state that I can only recognize the last picture shown in this exhibit.

Mr. Barton: The photograph last shown in this exhibit is marked in lead pencil "44-D."

Q. 25. What do you recognize it as representing? And what does it show?

Mr. Lyon: Same objection.

A. I recognize the building as to its appearance.

Q. 26. What building, in particular, does it show?

A. The construction itself, only.

Q. 27. And of what particular building?

A. The Majestic Theater Building, as it is called.

Q. 28. State whether or not you have seen other photographs showing the progress of the construction of the Majestic Theater Building.

Mr. Lyon: Objected to as leading and suggestive, incompetent, no foundation laid.

A. I have not seen any other photographs.

Q. 29. State if you know who was in charge of the concrete work construction of the Elks Building.

A. To my knowledge, Mr. Emtman was the superintendent in construction of that building, but I have not met him there in that capacity.

Q. 30. Do you recall, and if so, you may state, about the time of the construction of the Christian Science Church at Pasadena?

A. The Christian Science Church at Pasadena was one of the early buildings for which I supplied through my department all necessary [fol. 630] tools and machinery and other iron work, and it was built perhaps in the latter part of 1908 and also 1909.

Q. 31. Who was the superintendent?

A. On this building, Mr. Emtman was superintendent.

Deposition closed.

Kurt O. Wetzel.

Los Angeles, California, May 3rd, 1921.

Met pursuant to adjournment.

Present: George P. Barton, for defendants; Frederick S. Lyon, for plaintiffs.

LUTHER M. HILL, the next witness, having been first duly sworn, testifies in behalf of defendants in response to questions of counsel as follows:

Q. 1. Please state your name, age, residence and occupation.

A. Luther M. Hill; age, 38; residence, 203½ West Santa Barbara Avenue, Los Angeles; occupation, general manager for Charles A. Fellows, contractor, Los Angeles.

Q. 2. What has been for your work, say, for the last fifteen years?

A. For the last five years in the present position; for the five years previous to that, estimator and engineer for Carl Leonardt, contractor, of Los Angeles; for the four years previous to that time, estimator and assistant superintendent for the Alta Planing Mill Company. They were general contractors of Los Angeles. My duties in all of this time have been to estimate the cost of buildings and bridges by counting the pieces in them, or otherwise reducing them to units; of listing and ordering materials required; of listing equipment required, laying out the work, and generally supervising its construction.

[fol. 631] Q. 3. I wish you would state in a general way the extent and character of the contracting work of the three different concerns you have mentioned, with which you have been connected.

A. During the first four years of the time specified above, we constructed one hundred and forty-eight buildings, in and around Los Angeles. These buildings were of various sizes, from the smallest bungalow or residence to such buildings as the original Kerckhoff Building, which is eleven stories, with steel frame and reinforced concrete floor construction; of such buildings as the seven-story reinforced concrete Pantages Theater Building on the east side of Broadway between Fifth and Sixth Streets—in fact of practically every class of commercial, factory, or residence building. During the five years that I was in the employ of Carl Leonardt, we constructed principally factories and commercial structures, among these was the Hall of Records, which is eleven or twelve stories with structural steel frame and reinforced concrete floor construction; the Washington Building, which is eleven stories, with construction similar to the Hall of Records; the Stowell Hotel, which is of reinforced concrete twelve stories in height; the Gates Hotel, which is of reinforced concrete, nine stories high, and many other commercial structures.

During the past five years, while in the employ of Charles A. Fellows, I have handled principally railroad buildings, which we constructed under contract for the Atchison, Topeka and Santa Fe Railway Company. These buildings range from four-room frame section houses, with necessary outbuildings, to 34-stall reinforced concrete round-houses. Of the passenger station at Colorado Springs,

which cost approximately $200,000, and of principally every class of building to be found along the railroad right-of-way. Among [fol. 632] other buildings we are completing at the present time, is the reinforced concrete ice manufacturing plant for the Santa Fe, just east of Los Angeles.

During the past fourteen years, I have been in active charge of more than $1,000,000 worth of work per year, and during the last five years, probably $2,000,000 worth of construction work per year.

Q 4. State if you recall the construction of the Majestic Theater Building. Here you have a picture of it. Will you please refer to it?

A. The Majestic Theater Building was of reinforced concrete construction, with possibly some structural steel members and eight stories in height. There is a picture of this building about the center of the catalogue published by the Concrete Appliances Company of Los Angeles.

Q. 5. Is it the picture to the left of the title, "Hamburger Majestic Theater" in said catalogue?

A. It is.

By Mr. Barton: The picture referred to is offered in evidence to be marked "Defendant's Exhibit 59, Picture Majestic Theater Building."

Q. 6. Will you state where you were living at the time the Majestic Theater Building was under construction?

A. At 921 South Olive Street, Los Angeles.

Q. 7. And what is the location of the Majestic Theater Building?

A. On the west side of Broadway, near Ninth Street, Los Angeles, which is, I believe, three blocks east and less than a block north of where I was living. I passed this building night and morning on my way from and to work.

Q. 8. I wish you would go on and state fully and at length what [fol. 633] you saw in connection with the progress of the work of construction of the Majestic Theater Building.

A. I noted that this building was of reinforced concrete construction, and was interested, as any student actually engaged on similar work would be. I had never seen the plans for the building. I had watched its construction, partly out of curiosity, for the reason that the shoring which carried the form work over the theater proper was very heavy, and I was curious to know why, not knowing that the space over this theater was to be utilized. My chief interest centered in the system being used to distribute concrete. This system was new to me, and I inspected the methods used very closely, as it seemed to have merits, and I thought possibly that we could use this system to advantage on our own construction work.

Q. 9. Please go on and describe what the system of concrete distribution was, as you saw it at that time.

A. The system employed was to mix concrete on the ground and hoist it to a point well above the place where it was to be deposited into the form, dumping it into a hopper near the top of the construction tower. This was the usual method of mixing and hoisting concrete. From this hopper near the top of the tower the concrete was

conveyed by gravity through a pipe and deposited in forms. If my memory serves me right, and I think it does, this spot was supported by a scaffolding and tripods and was accessible from scaffolding in order that men might shake it, or otherwise start the concrete to flowing after it had choked up and filled the pipe.

Q. 10. Give, if you can, the picture that you have in mind now of the pipes, how they were supported, and if they were moved from time to time, state how they were moved—by what means or power.

[fol. 634] Mr. Lyon: Objected to as incompetent, and as leading and suggestive.

A. My memory is that they were supported as specified above, either by scaffolding or by tripod, and that they were moved as required by employees on the work. I know of no device for performing such labor; that is, at that time.

Q. 10a. Do you wish to be understood as saying that when a pipe was to be moved, the workmen took hold of it and carried it around?

Mr. Lyon: Objected to as leading and suggestive.

A. I do.

Q. 11. You may state whether you recall the use of a boom for supporting the chute or pipe as used in the construction of the Majestic Theater Building.

Mr. Lyon: Objected to as leading and suggestive; not proper manner of proof.

A. I do not remember of having seen a boom used in connection with the concrete distributing apparatus on this building.

Q. 12. You may state whether your observation was such that, if there had been such a boom used, you would have observed it, in your opinion.

Mr. Lyon: Objected to as leading, as incompetent, calling for a conclusion of the witness, not for a statement of facts—not the proper method of proof.

A. The concrete was hoisted——

Mr. Lyon: Answer the question, not something else.

Mr. Barton: I object to this gratuitous interruption of the witness, just as he was starting to do what counsel has asked him to do.

[fol. 635] Mr. Lyon: Read the witness the question. The witness will answer the question as it is asked and not something else, and it calls for a yes or no answer.

By Mr. Barton: It is for the witness to respond to the question in his own way.

A. Yes; it was. May I supplement that?

Q. 13. Yes; state anything further that you may wish to say to elucidate your answer.

Mr. Lyon: Same objection as noted to preceding question.

A. It was at times possible to see the spout and everything above it, from the time concrete was emptied into the spout, until its discharging end disappeared into wall forms of the building. I believe I would have seen a boom, had there been one.

Q. 14. You spoke of your observing the progress of that work, as being in the position of a student. What particular part of the work were you interested in in that connection?

A. All of it, as I was a student of structural engineering applying any knowledge that I might acquire from day to day on the work in which I was engaged. I was particularly interested in the method of depositing concrete in the forms for the reason that it looked to be much more economical to place concrete by the gravity method than it would be to place it by the usual methods employed at that time.

Q. 15. You have spoken of work done for the Sante Fe Railroad Company. Do you recall a job done at Las Vegas, New Mexico, and if so, state if you know what apparatus was there employed?

Mr. Lyon: Objected to as incompetent, irrelevant and inadmissible and immaterial to the isues of the case.

[fol. 636] A. I do remember this building.

Q. 16. My principal purchased from the Insley Manufacturing Company apparatus with which to place concrete on this work, and this apparatus was installed under the personal direction of their San Francisco representative, Mr. Garfield Myers.

Q. 16a. Please describe that apparatus, and state with what success, if with any success, it operated.

Mr. Lyon: Same objection as noted to preceding question.

A. The apparatus consisted of a one-inch steel cable, either end of which was attached to what is known as a dead-man in the ground, and its center resting on and supported by a construction tower, approximately 15 feet high. Standard Insley spouting was suspended from this cable with tackle, with the exception that the upper end of the spout was supported by a hopper at top of tower, and that a section fifty feet long at lower end of spout was supported at its upper end from the cable, and its lower end on a tripod. This lower section was so arranged that it could be mover horizontally in a circle providing our forces were large enough to lift it. It was taken down for the reason that it had been determined that we could place concrete much more economically without the apparatus than with it. Theoretically, it looked practicable, but in reality, it proved to be very burdensome and expensive.

After this apparatus had been taken down, the Insley Manufacturing Company sent Mr. Lee Callahan to me in the capacity of an expert. Mr. Callahan handed me letters from Mr. Garfield Myers and also Mr. Fellows, introducing himself, which, however, was quite unnecessary, as I had known Mr. Callahan for ten years. It is possible that I had only known Mr. Callahan eight or nine years. My instructions from my principal were to allow Mr. Callahan to [fol. 637] set the apparatus up again in any manner that he might

see fit, which he did by having constructed a wood boom, approximately 3 feet square at its center, and 160 feet long. One end of this boom after being raised was supported on one corner of our construction tower by forgings made especially therefor. Two cables were then fastened to the tower near its top with the other end of these cables attached to a forging on the end of the wood boom. The Insley spouting was then cut up into short lengths from five to six feet long, and the plates and lacing on top of spouts removed. These short pieces of spouting were then attached to the two cables, one running on either side, by wires. At the upper end of this spout, a standard Insley spout hopper was supported immediately under the gate below receiving hopper on tower. This spout then traveled downward at an angle of approximately 25 degrees, with its discharge end at end of wood boom. A short section was counterweighted to outer end of boom, and the apparatus so arranged that the boom would swing a three-quarter circle horizontally, and the counterweighted section horizontally for a full circle. This apparatus would then have allowed us to reach any point in the building with ease, providing it had been properly constructed. The boom was entirely too light, considering its length, and had been constructed over my protest. It failed fifty feet from its outer end, nearly causing serious injury to several of my employees. It having been satisfactorily demonstrated to Mr. Callahan that his apparatus was wholly impracticable, it was taken down and he left the work. We then constructed smaller and lower towers near the front of the building, and constructed a system of spouting similar to the larger one, but with only a 40-foot boom, and with spouting made from 24 x 72-inch sheet iron, which we happened to have on [fol. 638] the job. This apparatus served nine stalls, and while it was not more economical than the concrete could have been placed by other means, it served its purpose and satisfied my principal, as well as the Insley Company.

Q. 17. You speak of concrete placed by other means. What other means had you in mind?

A. By hoisting concrete and dumping it into a receiving hopper at a point above the line where the same was to be deposited, thence conveying it in wheelbarrows or standard concrete cars to where it was to be deposited into forms.

Q. 18. Was that the Insley apparatus paid for?

A. No, sir.

Mr. Lyon: Objected to as leading and as incompetent and immaterial.

Q. 19. They never asked you to pay for it, did they?

Mr. Lyon: Same objection.

A. No, sir.

Q. 20. You spoke of the relative economy of placing concrete by the gravity method and by other methods. Will you explain what you mean by this, and state if you know under what circumstances one method or the other may be the more economical?

Mr. Lyon: Objected to on the ground that it is incompetent and on the further ground that no leave has been granted the defendants to take expert testimony.

A. I can hardly answer that. It is necessary for a construction man to use judgment. It is only possible for any one to determine by empirical rules how it would be possible to place concrete or even to construct a building most economically.

Q. 21. What methods have you adopted as the more economical? [fol. 639] What methods do you employ at the present time?

Mr. Lyon: Objected to as irrelevant and immaterial, and on the grounds stated in regard to previous question.

A. I employ a gravity system, where I think it possible to place concrete most economically by that method; where I do not, I use any one of several methods which I consider to my advantage. We used carts on the last building constructed.

Q. 22. Does C. A. Fellows or any one else, so far as you know, pay royalties for the use of the gravity system?

Mr. Lyon: Objected to as leading.

A. Mr. Fellows does not.

Q. 23. In planning your work, do you use the gravity system without reference to any patents just as freely as if no patents had been issued?

Mr. Lyon: Objected to as leading.

A. I do.

Q. 24. About what was the date of the installation of the work at Las Vegas?

Mr. Lyon: Objected to as irrelevant and immaterial.

A. During the months of either September, October or November, in 1916.

Q. 25. I show you some photographs and will ask you if you recognize them.

Mr. Lyon: Objected to as having no foundation laid, and as leading and suggestive.

A. I have never seen these pictures before. I recognize Mr. George Everhardt in the uppermost, and the front view during construction, of the Majestic Theater.

[fol. 640] By Mr. Barton: It is noted that the photographs referred to are "Defendants' Exhibit 44, Photographs A, B, C, D, Majestic Theater."

Q. 26. I will ask you to state if you know what are the advantages or differences in the strength of concrete when placed by the old method by wheelbarrows or wagons, and when the mush is distributed to the forms by gravity.

Mr. Lyon: Objected to on the ground that it calls for expert testimony and defendants have not been granted leave to take expert testimony by deposition and on the further ground that no foundation is laid and as irrelevant and immaterial.

A. There is no recognized difference. The strength of concrete is determined theoretically by the proportions of cement and aggregates.

Mr. Barton: I will ask for a recess until 2 p. m.

Met pursuant to adjournment, same parties present.

By Mr. Barton:

Q. 27. You told me you wished to make some statement upon the record. You may go on and do it.

A. Well, I stated that we did not use gravity for placing concrete on the last building constructed, and I wish to correct that statement, as we did dump some concrete from receiving hopper at top of construction tower into chutes, allowing it to flow by gravity into place. In fact, we have dumped concrete from wheelbarrows or carts into chutes or spouts at times during the construction of every building that I ever worked on where concrete was used at all. I do not mean to imply that we used the so-called gravity system; only that we used some form of chute to guide concrete into the forms. I wish further to state that I have been en- [fol. 641] gaged on construction work in one capacity or another, either as water-boy, carpenter's helper, or journeyman carpenter since I was twelve years of age.

Witness dismissed.

Luther M. Hill.

Swan P. Johnson, the next witness, having been duly sworn as a witness in behalf of defendants, testifies in response to questions of counsel as follows:

By Mr. Barton:

Q. 1. Please state your name, age, residence and occupation.

A. Swan P. Johnson; 51 years; 243 West 57th Street; put me down as a carpenter, a general superintendent.

Q. 2. State whether or not you have been associated with Hugh W. Bryson and Theodore Emtman in any construction work.

A. I worked for Mr. Bryson for the F. O. Engstrum Company, with Mr. Bryson as general superintendent for practically fourteen years, and as partner with Theodore Emtman for about a year and a half.

Q. 3. At the present time you are working independently, aren't you?

A. Yes, sir.

Q. 4. And you have been for about three years.
A. For about one year.
Q. 5. Do you remember the construction of a building known as the Majestic Theater Building in Los Angeles?
A. I do.
Q. 6. Were you in charge of that construction?
A. No, sir.
Q. 7. Do you remember the construction of the Wright-Callender Building, Fourth and Hill Street?
A. I—some of it when it was first beginning, yes.
[fol. 642] Q. 8. Who had charge of that construction?
A. I don't know.
Q. 9. To refresh your recollection I will ask if you know of the Kubach Company.
A. Not personally.
Q. 10. State if you remember how the concrete was placed in the construction of the Wright-Callender Building.

Mr. Lyon: Objected to as irrelevant and immaterial and not competent; no foundation laid and not rebuttal.

A. I can answer the question, can I? So far as my recollection goes, I saw a mixer standing on the hill, and concrete running down by gravity.
Q. 11. About what time was that?
A. I couldn't recollect the year.
Q. 12. Was it before or after the construction of the Majestic Theater Building?
A. I couldn't say, to be positive.
Q. 13. State if you had to do with the construction of the building in San Diego known as the Timken Building.
A. I had charge of the inside finish.
Q. 13. And about what time was that?
A. It was in the winter, but I don't remember the year.
Q. 14. About how long after that building was started was it before you went there to finish it?

Mr. Lyon: Objected to as incompetent, no foundation laid. It is not shown that the witness has any knowledge of when the building was started.

A. Three or four months.
Q. 15. Do you remember any accident to the apparatus while you were there?

[fol. 643] Mr. Lyon: Objected to as leading and suggestive, irrelevant and immaterial.

A. There was no accident on my part while I was there.
Q. 16. Do you recall that there was a windstorm and that apparatus was blown down?

Mr. Lyon: Objected to as leading and suggestive.

A. Why, I seen the place where it had fell through the roof of an adjoining building. That's all I know about it.

Q. 17. State whether or not you visited the Majestic Theater Building while it was under construction with Mr. F. O. Engstrum.

Mr. Lyon: Objected to as leading.

A. I visited that building about three or four times during the beginning of it and I ran across Mr. Engstrum one Saturday night at the building.

Q. 18. And do you remember what he told you at that time?

A. Well, he was mad, because he said the boys were using too much lumber building towers and trestles for running concrete there.

Q. 19. What were the trestles for?

A. Some were to support the pipes in certain places.

Q. 20. Now, will you state what the construction is above the auditorium of the theater—the roof?

A. It has a heavy girder to carry the ceiling of the auditorium, the ceiling of the dome, rather. It has a dome inside.

Q. 21. What is the shape of the dome?

A. Well, I would call it egg-shaped.

Q. 22. And when you and Engstrum were there, what, if anything, did you see in the way of shoring or supports for this dome?

[fol. 644] A. Why, the beams were supported with timbers, as we always do in heavy constructions.

Q. 23. You are now in the concrete construction business, are you?

A. To a certain extent, yes.

Q. 24. And how do you distribute the concrete?

A. With wheelbarrows, carts, whichever is handiest.

Mr. Lyon: No cross-examination.

[fol. 645] IN THE DISTRICT COURT OF THE UNITED STATES, EASTERN DISTRICT OF PENNSYLVANIA

In Equity. No. 2067

CONCRETE APPLIANCES COMPANY, a Corporation, and WILLIAM H. INSLEY, Plaintiffs,

vs.

JOHN E. GOMERY, JOHN C. SCHWARZ, MICHAEL J. O'MEARA, and CONCRETE CONSTRUCTION COMPANY, Defendants

Met pursuant to the annexed notice at the office of Messrs. Pillsbury, Madison & Sutro, Standard Oil Building, San Francisco, California, May 26th, 1921, before Frank L. Owen, notary public in and for the City and County of San Francisco, State of California.

Present: George P. Barton, Esq., of counsel for defendants; Frederick S. Lyon, Esq., of counsel for complainants.

CHARLES C. HORTON, being first duly sworn according to law as a witness on behalf of defendants, testified as follows:

Direct examination by Mr. Barton:

Q. 1. Please state you name, age, residence and occupation.

A. Charles C. Horton; age 44; residence, 601 14th Avenue, San Francisco; occupation, contractor, more particularly vice president of the Healy Tibbetts Construction Company.

Q. 2. About how long have you been connected with the Healy Tibbetts Construction Company?

[fol. 646] A. Since 1892.

Q. 3. Please state the general nature of the work done by your Company?

A. Wharf and dock construction, bridges and general heavy construction.

Q. 4. Please state whether that work involves the placing of concrete?

A. We place a great deal of concrete in connection with contracts.

Q. 5. State, if you remember, what work, if any, you had going on at the time of the earthquake and fire at San Francisco?

A. We were just finishing the construction of piers 42 and 44 on the San Francisco water front at the time of the earthquake on April 18th, 1906.

Q. 6. Will you state the magnitude of that work in a general way?

A. The contract price on the two piers was about $300,000. The work consisted of two concrete piers, supported on concrete cylinders ranging in length from 50 to 80 feet, 3 to 5 feet in diameter. On top of these cylinders was constructed a reinforced concrete deck. The superstructure was of wood.

Q. 7. State approximately how long and how wide was each of these piers?

A. The piers were about 650 feet long by 120 feet wide.

Q. 8. State whether the piers are now in use?

A. The piers are still in use, but have been more or less reconstructed.

Q. 9. State the location, if you will?

A. These piers are on the southern part of the San Francisco water front at the foot of Second Street.

Q. 10. State if you recall how these piers were utilized immediately after the earthquake and fire.

[fol. 647] A. Do you mean who occupied them?

Q. 11. Yes.

A. They were used by the Southern Pacific Railway immediately after the earthquake for storage purposes.

Q. 12. Were they——

A. Just a moment, Mr. Barton. I made a mistake when I stated that the decks were entirely of reinforced concrete. Steel beams were used in part of the construction in conjunction with wood stringers and concrete.

Q. 13. State whether those piers were used immediately after the earthquake and fire for those who had been driven out of house and home.

Mr. Lyon: Objected to as irrelevant, immaterial and incompetent.

A. The only knowledge I have of the use of the piers is that we arranged through the president of the Board of Harbor Commissioners to permit the Railroad Company to use them before the final acceptance. This, of course, included the dockage of vessels and the storage of freight under the sheds.

Q. 13a. You may state if you know how the concrete for those cylinders was placed, what appliances did you use in that connection; and state further, if you know, where any of such appliances, if any, may be found now.

A. The most of the concrete was poured in position from a floating barge. The ruins of what is left of this barge can now be seen in our Company's boom just west of the Western Pacific Railway Company's ferry slip at the foot of 25th Street, San Francisco. This barge consisted of a material bunker, into which the concrete aggregates were placed by means of a grab bucket operated from a floating derrick barge alongside. The materials were also stored on other barges within reach of the boom of the derrick barge. When [fol. 648] the aggregates were placed in the bunker on board the mixing barge they run by gravity to the concrete mixer. When thoroughly mixed they were dumped into a skip which was hoisted in a wooden tower about 60 feet in height and there dumped into a hopper at the top of the tower. This hopper was operated by a man from an elevated platform just above the level of the hopper described above. This hopper had an adjustable opening and when it was desired to place the concrete in one of the cylinders a signal was given to the operator at the top of the tower and he opened the gate and permitted the concrete to run to the cylinders through a trough. This trough was held in suspension by means of a pivoted boom attached to the tower of the mixing barge. I think that completes the pouring of the concrete.

Q. 14. How recently have you seen that barge?

A. This morning.

Q. 15. You have spoken of a trough for carrying the concrete; will you describe that more in detail?

A. This is a metal half-circular trough built of sheet iron and reinforcing angles along the edge in sections about 2½ or 3 feet long, the various sections being held together by hooks and chains.

Q. 16. State if you recall just how the different sections articulated with each other, if at all?

A. They were suspended and held in position by guys from boom so as to afford a flexible pipe through which the concrete could easily run.

Q. 17. What was the purpose, if any, of having the pipe flexible?

A. So that its angle could be changed affording little trouble in moving it from one cylinder to another.

Q. 18. State whether it could be moved so as to reach different cylinders without moving the barge?

[fol. 649] Mr. Lyon: Objected to as leading and suggestive.

A. The boom that suspended the trough was a pivoted boom giving free movement up and down and also sideways. This permitted us to adjust the position of the trough at any angle either vertical or horizontal.

Q. 19. Describe what the connection was between this chute and the hopper you have described as being up in the tower?

A. That was a loose joint connection as I recall it, so as to permit the chute to swing and change its angle from that point.

Q. 20. Will you describe just how the boom from which the chute was supported was connected with the tower? What kind of a joint or connection?

A. I can't give you the details of this connection. All I can say is that it permitted the boom to operate both horizontally and vertically. This equipment was constructed 15 years ago and has long since been abandoned and it is difficult to remember just what the exact detail was. However, our construction superintendent is available and he can probably give you this information, as he was in charge of the construction of these piers at that time. His name is Mr. Martin E. Brown.

Q. 21. You have mentioned a platform on which a man stood who I understand opened a gate on signal. How was that platform placed in altitude with respect to the hopper?

A. That platform is still on the wrecked barge and can be seen. My recollection is that it was just at the top of the hopper.

Q. 22. I wish you would describe more in detail what the condition of that apparatus is as you saw it this morning.

A. The hull of the barge is intact, the tower that once stood ver-
[fol. 650] tically has been cut away from the deck and thrown over; the original hopper into which the concrete was dumped near the top of the tower is still in the wrecked portion of the tower; the gate from this hopper to the chute is still available, and is in its original condition in reference to the hopper. The first length of the trough which was directly connected below the gate described above is lying on the premises near the barge, on the shore.

Q. 23. Describe that piece or part that is lying on the shore.

A. It is a metal circular troughed end, gradually diminishing in diameter so as to fit the trough itself.

Q. 24. Do you recall how many standards or posts were used to support the tower?

A. There were six vertical posts with two batter braces, all of which can still be seen.

Q. 25. What is the material of the tower?

A. Oregon pine lumber.

Q. 26. Now, as I understand you, there was a suitably supported horizontally movable boom connected with the tower?

A. There was.

Mr. Lyon: That is objected to as leading.

Q. 27. And you may state whether or not there was a chute or conduit carried by the boom.

Mr. Lyon: Objected to as leading.

A. The concrete trough that I have previously testified to was used as a chute or trough.

Q. 28. And state whether or not that trough was carried by the boom.

Mr. Lyon: Objected to as leading.

Q. 29. Or how was it connected with it?

A. It was suspended from the boom by means of ropes and cables.

[fol. 651] Q. 30. What means, if any, were there in that apparatus for raising plastic material to a suitable point in the height of the tower?

A. You mean the mixed concrete?

Q. 31. Yes.

A. I have already testified that the mixture discharged into a skip which was hoisted to the top of the tower by a steam donkey engine aboard the barge.

Q. 32. And what means if any did you have for receiving the plastic material from that skip?

A. It was dumped into the hopper at the top of the tower.

Q. 33. And how if in any way was the plastic material or mush gotten into the chute or conduit?

A. Through a gate operated from platform near top of tower, and it run through the trough by gravity.

Q. 34. You have said that the boom was connected to the tower; what, if any, means was employed or supplied by which the boom might be connected at different points in the height of the tower?

Mr. Lyon: That is objected to as leading and suggestive and assuming facts not testified to by the witness.

A. I cannot describe the detail of this connection; all I know is that the connection between the boom and the tower was such that it was adjustable up and down the tower to suit the particular work being done at different times.

Mr. Lyon: The answer is further objected to as incompetent, a conclusion of the witness, and not a statement of facts, and not responsive to the question, and as incompetent.

Q. 35. You have stated that this barge with apparatus for plac-

[fol. 652] ing concrete was used in the construction of piers 42 and 44 before the earthquake. About how long before the earthquake, if you know, was that apparatus installed?

A. It required about a year to put the concrete in the cylinders of these piers, so that this barge must have been built from 12 to 15 months previous to April, 1906.

Q. 36. And what if anything was done with this barge and the apparatus after April, 1906, until it was abandoned?

A. We used it at various times for the next four or five years on other dock construction on the water front of San Francisco.

Q. 37. In my notice I gave the name of W. H. Healy. State if you know him and where he is now, if you know, and when you may expect he will return to San Francisco, if he is away.

A. Mr. W. H. Healy is the president of our company, is at the present time sick with sciatica at Byron Hot Springs, and will probably not return to business from two to three weeks from this time.

Q. 38. You may state if you know whether he was familiar with this apparatus for placing concrete?

A. Mr. Healy was familiar with this apparatus and saw it in operation.

Mr. Barton: Direct examination closed.

Cross-examination by Mr. Lyon:

X Q. 1. Has the Healy Tibbetts Construction Company been engaged in building any reinforced concrete buildings in San Francisco since April, 1906?

A. Yes.

X Q. 2. Oh, approximately how many and what was their general character?

A. I would say we built about 20 reinforced concrete buildings; [fol. 653] some were office buildings and others were industrial plants.

X Q. 3. On those buildings you used the wheelbarrow method of distribution of concrete, did you?

A. I yould say we did in most cases, yes.

X Q. 4, When you say in most cases, please describe more fully what you mean.

A. In placing concrete in a building you use a tower and hoist the material by means of a skip to various elevations required and then dump it into a hopper. If it is to be used within limits, so that gravity distribution is advisable, we often install a temporary wooden trough from the hopper and distribute it by this means in place of barrows.

X Q. 5. That would be a straight trough from the hopper to the point to which you delivered the concrete; is that right?

A. That is a trough supported from the floor of the structure by means of wooden supports.

X Q. 6. If I understand you correctly, this old barge and apparatus which you say you again inspected this morning previous to testifying, does not now contain the boom itself, does it?

A. No, sir; it does not.

X Q. 7. When was it dismantled?

A. Now, I don't think we used it for the last eight or ten years.

X Q. 8. According to your best recollection, when and on what job did you last use it?

A. I can't recall the particular job; we have built 15 or 20 piers

on this waterfront, and it was those immediately following the construction of piers 42 and 44 on which it was used. I will add that those piers were adjoining piers 42 and 44 and were probably 36 and 38.

X Q. 9. You don't remember when those were built?

[fol. 654] A. They were built from 1907 or '08 up to 1911, I should think.

X Q. 10. You know what became of the boom that was on this barge in 1906?

A. I do not.

X Q. 11. Can you state whether it was removed from that barge? I want a definite statement, Mr. Horton, not a guess. If you cannot remember definitely, please state so.

Mr. Barton: Just a moment. It is suggested to the witness that he has control of the form of his own answers.

A. It was removed. Do you want me to tell you why?

X Q. 12. I asked you when?

A. As soon as the work on which it was used was finished.

X Q. 13. And you can't give the date?

A. Too long ago for me to remember any dates.

X Q. 14. How was the concrete handled for the decks on piers 42 and 44?

A. There was very little concrete in the decks of those piers.

X Q. 15. And how was what concrete there was in those decks handled and distributed?

A. I don't recall. This outfit was principally for depositing the concrete in the cylinders.

X Q. 16. In the cylinders?

A. Yes.

X Q. 17. So far as your recollection goes, it does not enable you to state that what concrete was used on the deck was distributed by this tower and boom method, does it?

A. My answer to that would be that I can't recall where any concrete was used on the deck other than along the waterfront line, where a permanent wall was built. If you recall, you will remem- [fol. 655] ber I corrected myself on that.

X Q. 18. Then your present recollection is that the decks of piers 42 and 44 were not of concrete?

A. My present recollection is that the decks are supported by steel beams on top of the cylinders and wooden joists and wooden planking above.

Mr. Lyon: That is all.

Mr. Barton: No redirect.

Chas. C. Horton.

An adjournment was here taken until 2 p. m.

Met pursuant to adjournment. Same counsel present.

The witness CHARLES C. HORTON, being recalled on the part of the defendants, testified in response to questions as follows to-wit:

By Mr. Barton:

Q. 39. I will ask you, since you have closed your deposition, if you have had a sketch or drawing made?

A. We have.

Q. 40. Is this which I hold in my hand and which I hand you the sketch or drawing in question?

A. It is.

Q. 41. Please state how the apparatus illustrated in the sketch compares with or differs from the apparatus which you described in your previous deposition as used in connection with placing concrete, and in this connection you may make any correction that you may wish to make in your previous deposition?

Mr. Lyon: Objected to as leading and suggestive and incompetent, no foundation laid, not the best evidence, calling for the mere con-[fol. 656] clusion of the witness and not for a statement of facts, and not a proper method of proof.

A. The sketch referred to is a reproduction of the barge used by the Healy Tibbetts Construction Company during 1905 and 1906 in mixing and pouring concrete in the construction of piers 42 and 44 on the waterfront of San Francisco. In connection with my previous testimony I find in discussing the matter with Mr. Brown, our superintendent——

Mr. Lyon: We object to any statement of any conversation had by the witness with others, since leaving the stand today, or at any other time, on the ground that the same is incompetent, not being shown that such conversation is in any manner binding upon the plaintiffs, nor was any representative of the plaintiffs present.

Witness (continuing): That the trough used was a full circular pipe and not a trough, as previously stated.

Q. 42. Will you point ont on the drawing if it appears there the illustration of the pipe or chute in question?

Mr. Lyon: Same objection as last noted on the record.

A. This is the pipe referred to (witness runs his finger along the tructure over which appears the words "Flexible joints held together by chains").

Mr. Barton: That is all.

Cross-examination by Mr. Lyon:

X Q. 43. Since leaving the witness stand this noon, with whom besides your superintendent, Mr. Brown, have you discussed this matter?

A. Our engineer, who prepared this drawing, and Mr. Barton.

X Q. 44. You did not make the drawing that you have produced, did you?

[fol. 657] A. Made under my supervision with Mr. Brown.

X Q. 45. Did you give to such engineer the details for this drawing?

A. Just what details do you refer to?

X Q. 46. Any of them.

A. Some of them.

X Q. 47. Which ones?

A. The general detail of the tower, mixer, location of engine, boom and pipe. I am capable of giving this detail by reason of my examination about it this morning.

X Q. 48. Do you know who gave such engineer or draftsman the details of construction which are shown on this sketch?

A. Mr. Brown.

X Q. 49. Were you present and discussed the matter with him at the time?

A. Part of the time.

X Q. 50. Was that before you went on the stand this morning?

A. Both before and since.

Mr. Lyon: That is all.

Chas. C. Horton.

MARTIN E. BROWN, called as a witness on behalf of defendants, being first duly sworn according to law, testifies as follows:

Direct examination by Mr. Barton:

Q. 1. Please state your name, age, residence and occupation.

A. Martin E. Brown, 320 Edinburgh Street, San Francisco, California; superintendent of construction for Healy Tibbetts Construction Company, San Francisco.

Q. 2. How long have you been in the service of that company?

[fol. 658] A. Twenty years or more.

Q. 3. State in a general way the character of your work or duties.

A. My duties consisted in directing the men in the construction of equipment for the lines of pile driving, bridge building, wharf work and the like.

Q. 4. State what your immediate employment was if you remember in the year 1905, and up to the time of the earthquake.

A. Superintendent of construction for the Healy Tibbetts Company.

Q. 5. What particular work did you have under way at that time?

A. We had under construction at that time the building of new piers 42 and 44 on the waterfront of San Francisco.

Q. 6. And who was in immediate charge of that work?

A. I was in immediate charge of that work as overseer.

Q. 7. Will you state in a general way how large those piers are and also state how they were constructed?

A. The piers in size were about 200 feet wide and 600 feet long from the bulkhead line to the end of pier. The construction consisted of the placing for foundation, large wooden cylinders 4 to 6 feet in diameter, and from 60 to 80 feet long. These cylinders had to be erected on the dock, placed with a pile-driving equipment, driven to firm foundation, and thoroughly cleaned out to receive the concrete needed for supports for the dock proper. After removal of all earth from the inside of cylinders the concrete barge equipment for the placing of concrete in cylinders was brought alongside. The concrete was placed in mixer from bunker on barge that also contained the hoist and tower necessary for placing of the concrete. Where the cylinders in wharf were too far in from edge of dock to re-
[fol. 659] ceive concrete directly from barge, a large circular trémie was used to reach to all cylinders inside of wharf. The concrete was hoisted to top of tower, let out in receiving box, then by opening a gate, concrete was allowed to run through the trémie into cylinders until they were filled to proper proportions. After the completion of cylinders the top work followed, and the balance of deck work was done from the top out of wooden construction.

Q. 8. At the time of the earthquake, how far had the work progressed on piers 42 and 44?

A. The work had progressed about two-thirds complete.

Q. 9. How many of those openings with the wooden curbs would you have at one time to be filled?

A. We would endeavor to have ready before starting to concrete with the trémie a full row or eight cylinders, and by the time that they were filled with concrete others would be ready.

Q. 10. How was the material brought to the barge?

A. The material was loaded from a bunker at our quarries, brought by barge to the site, and placed in bunker on mixing barge by means of derrick barge.

Q. 11. How was the material moved from the barges that brought the material to the bunkers of the barge that you had the tower on?

A. That I have just described was the mixer barge. When the materials were moved into the bunker of the mixing barge by a derrick barge alongside.

Q. 12. Were there separate compartments for the material in the mixing barge?

Mr. Lyon: That is objected to as leading.

A. The barge that held the batch for the mixer had separate compartments for rock, sand and gravel. This was placed in mixer by
[fol. 660] gravity by releasing lever for each separate batch of concrete. The cement for this mix was placed on platform and handled by hand from the the platform for each batch of concrete.

Q. 13. And where was the mixture or mush delivered from the mixer?

A. After the mix was thoroughly mixed the mixer deposited the same in receptacle and then was hoisted by tower into a receiving box and spilled through trémie pipe out over walk into cylinders.

Q. 14. The box or receptacle into which the mixture discharged, as I understand you, was down low at the foot of the tower; is that correct?

Mr. Lyon: Objected to as leading and suggestive.

A. The concrete bucket received the mix from mixer at the bottom of barge and was hoisted by cable to receiving box at head of hoist tower.

Q. 15. Where was the bucket placed while it was receiving the charge from the mixer?

A. The bucket was returned after unloading at an opening placed inside of barge below the mixer so as the mixer discharged directly into the receiving bucket.

Q. 16. What power was used to raise that bucket when filled with the mush?

A. The bucket was hoisted by means of steam power. The mixer was driven by steam power.

Q. 17. Where was the engine that raised the bucket placed?

A. The engine that raised the bucket was placed on the after end of the mixer barge.

Q. 18. Describe the construction of the tower.

A. The tower was constructed of materials from main supports of 6x8 and braced by 3x6 and 4x6 side and X bracing. Inside of tower liners were placed of hardwood so as to guide the concrete bucket that was hoisted to the top of tower. At the head of tower a large cast-[fol. 661] iron sheave was used for rudder for mixer bucket. On the outside of concrete hoist tower was used of boom to take care of trémie that was used to place concrete in cylinders. This boom could be used at any angle found necessary in the moving of trémie from cylinders to cylinders, and the bringing out of cylinders to the pipe as the cylinder was completed, and for any light lumber work such as was found necessary in the construction of wharf.

Q. 19. You spoke of hardwood lining or facing; how many such ways were there in the tower?

A. The inside liners or guides for the concrete bucket, there were four liners used, one in each corner of the square tower, to guide the bucket along.

Q. 20. State whether or not you greased those ways.

Mr. Lyon: Objected to as leading.

A. It was necessary to grease the rollers on hoist but not the ways.

Q. 21. How many upright standards or poles were included in the tower?

A. The tower frame consisted of four upright stanchions, and were braced on the outside by four braces to support the box that received the batch of concrete at head of tower; there were two 2 x 6 straight supports cross-braced.

Q. 22. Who built that apparatus, if you know?

A. I cannot remember the names of the men that did the actual work, but I superintended the construction of same.

Q. 23. Do you remember the names of any of the men?

A. Well, Mr. Ayer, the man that I have with me—Fred Ayer. It is so long ago that it would be hard for me to think of the names.

Q. 24. What was the height of that tower?

[fol. 662] A. The height of the tower as near as I can recollect was 50 feet.

Q. 25. When did you see it last?

A. I looked at what was left of it this morning.

Q. 26. Who were present this morning?

A. In the presence of Mr. Horton and Mr. Barton.

Q. 27. Was Mr. Fred Ayer there?

Mr. Lyon: Objected to as leading and suggestive.

A. Mr. Fred Ayer was not there at the time I was there.

Q. 28. Describe more in detail the trémie, its construction, as it was used in the year 1905-1906.

A. As we used the trémie it was made of light iron reinforced for holding the sections which were 5 foot in length, and also some half sections to move in any angle or direction we wanted with short or long length as required to make handling easy. The sections could be telescoped and easily fastened together with small chains which were dropped over hooks on the ends of each section of pipe. In some cases where a concrete deck was necessary this trémie pipe was moved from 70 to 80 feet over face of dock to allow concrete to be placed in any difficult corner that may come up during the course of construction, and we found this trémie pipe construction the easiest method of doing our work, and used it whenever we could find occasion to do so.

Q. 29. In moving it over 70 or 80 feet, as you have mentioned, how was the change or changes brought about; just how did you do that?

A. Where the pouring of concrete necessitated the pouring of concrete over a distance of 70 or 80 feet the trémie pipe was handled by outrigger boom that was fastened to the concrete hoist and secured by bolts. This boom could be raised, lowered, or swung to [fol. 663] whatever angle found necessary by the raising and lowering of live boom.

Q. 30. You have stated, I think, that the piers were about 200 feet wide each; just where would you place the mixer barge with reference to the work you did near the center line of the pier?

A. We worked from one side of pier as far as we could work to advantage with trémie pipe and after going as far as we could in that manner the floating equipment all intact was moved around to the opposite side of dock and work concluded from the other side, that could not be completed from the first operation.

Q. 31. And how far in the length of the pier could you distribute the concrete without changing the position of the barge?

A. It would go any length that you cared to go according to the length of tower required to give you fall with your trémie pipe; in other words, the higher the tower, the more you could reach with trémie pipe, but with this particular rig that was in use at piers

42 and 44, 70 to 80 feet was about all we could work to good advantage.

Q. 32. How was the mush transferred from the hopper to the trémie pipe?

A. After the concrete bucket brought the mixed material to the top of hoist and placed in receiving barge, trémie was placed directly underneath receiving box and by the opening of a gate which was held by a lever the mixed materials would run directly into trémie pipe and be deposited where found necessary.

Q. 33. What kind of a gate was this?

A. The gate was made of sheet iron with a cast-iron face. It had a sliding movable part that was easily opened or closed at the will of the man operating it, by means of a lever handle.

[fol. 664] Q. 34. Where is that gate now?

A. The gate is now on the abandoned tower that was used at that time at our storage yard in South San Francisco.

Q. 35. When did you see the gate last?

A. I saw the gate last this morning.

Q. 36. Did you point it out to me?

Mr. Lyon: Objected to as leading and suggestive, and immaterial and incompetent, not being shown that any one was present at the time appointed.

A. I pointed out the gate to Mr. Barton.

Mr. Barton: Last evening I gave Mr. Lyon written notice of the two additional witnesses, Mr. Brown now on the stand and Mr. Ayer, who has been already sworn in this case, and in connection with my notice I stated that the barge was in existence and that this morning at low tide would be a good time to see it. Mr Lyon was reported as not in his room when I left the notice. I, however, gave my address as at the Clift Hotel.

I now renew the offer to show the borge to Mr. Lyon or to any expert; its location already appears from the depositions that have been taken. It is a matter of about twenty minutes' ride on the street car and a walk of, I would say, near quarter of a mile from the end of the street car line. We saw it at low tide.

Mr. Lyon: The statements of Mr. Barton are objected to as not evidence, and as incompetent. Plaintiffs demand that the best evidence be produced. If counsel for defendants wishes to rely upon merely oral testimony he does so at his own risk. I may avail myself of an opportunity to inspect the alleged barge hereafter, [fol. 665] but such inspection or offer to inspect must not be taken as any excuse for failing to produce record and physical evidence in the case. In regard to the note which you left at my hotel last evening you stated: "The barge is still in existence, and I offer to show it to you or any expert you may wish to examine it." What barge you referred to I had no knowledge of, and while you stated that low tide 8 o'clock this morning would be best time, I heard nothing further from you, although I did not leave the hotel until half past nine. However, plaintiffs shall insist that the best evidence be produced.

Mr. Barton: In explanation of my use of the word "barge" only, I will say that I telephoned to Mr. Lyon before we left Los Angeles that the San Francisco testimony would relate to the use of the invention on a barge about the time of the earthquake. I thought no further elucidation by words would be necessary.

Q. 37. State if you know what had become of the sections of the trémie; where are they now?

A. The sections of the trémie as near as I can recall have been used beyond repair, and we still have on hand in our storeyard some old sections of pipe that I believe were used on this same barge at the time we were doing the work at piers 42 and 44.

Q. 38. The particular section that was next to the gate; where is that, if you know?

A. One old section known as the head section of trémie is still on the rig at our Potero boom. The mixer box and the barge that hoists was constructed on are also at our Potero boom.

Q. 39. You may state whether or not there is a piece or section of the trémie upon the bank of the slip near the barge?

Mr. Lyon: Objected to as leading

[fol. 666] A. The piece or section of trémie that was used near the barge I had taken off of barge and placed on bank at the orders of Mr. Barton.

Q. 40. When was that?

A. That piece of pipe was taken from barge yesterday afternoon or Wednesday afternoon, May 25th.

Q. 41. And can you state whether that was one of the original pieces or sections of the trémie?

Mr. Lyon: Objected to as leading and suggestive, incompetent; no foundation laid.

A. That section or piece of trémie was used in connection with piers 42, 44, and other docks in the near vicinity, as near as I can recall.

Q. 42. Please describe that piece or section, if you can.

Mr. Lyon: Objected to as incompetent, not the best evidence, no foundation laid for the introduction of secondary evidence, and it is not identified.

A. The section of pipe used at the head of hoist would not receive as much wear and tear as sections further down the line, but from the position of the present piece of pipe, in my judgment, it had had quite a bit of wear, as near as I can remember.

Q. 43. State the shape of it and whether or not any portion has been broken off and is not there.

Mr. Lyon: Some objection, incompetent.

A. The piece as now is has deteriorated and rusted away from lying for years in the open. As for it being broken by other means

outside of the evidence I cannot state, as anything of this kind has taken place; simply worn out from old age. The connecting straps which were heavier than the circular trémie pipe itself are still in good condition.

Q. 44. You have stated that you used this mixing barge with the [fol. 667] tower and other parts in the construction of piers 42 and 44. You may state whether or not that same barge and apparatus were used subsequently, and if so, when and to what extent?

A. The same mixer barge, tower, bunker and complete apparatus used by steam power was used at piers 42 and 44 until work was completed. Then after a short space of time when it was stored it was again taken out for use in the construction of piers 36 and 38, which were of concrete cylinder construction similar to piers 42 and 44. This same tower rig was used about a year's time in the construction of each pier.

Q. 45. And about what time was it moved to the place where we saw it this morning?

A. I cannot positively state when it was moved to where you found it this morning, but it was after, as I stated previously, the completion of piers 36 and 38, which was four or five years after that time, after the work that was done at piers 42 and 44, and that work was being done in the years 1905 and 1906.

Q. 46. You may state whether you have used other similar apparatus since that time.

Mr. Lyon: That is objected to as leading and suggestive, incompetent, no foundation laid, not the best evidence, calling for the conclusion of the witness, not the proper method of proof.

A. We have used from the time of retiring this rig in question similar rigs and have now on hand rigs constructed almost alike at our plant to be seen if found necessary at Sheep Island on San Francisco Bay.

Q. 47. Reference has been made to a boom which was attached to the tower to support and control the trémie pipe. Will you state just how that boom was fastened or secured to the tower?

[fol. 668] Mr. Lyon: Objected to as leading and suggestive, as incompetent, not the best evidence, no foundation laid for the introduction of secondary evidence.

A. The boom was fastened to main tower by timber of size of about 8 x 8, bolted to sides of tower and could be raised or lowered at the discretion of the man in charge when found he could work at a higher or lower level to suit his conditions under which he was working. The boom proper was ironed off with bolts and lead bars so as it could be easily taken out and placed up or down hoist as found necessary by the simple letting go of a few bolts. Steam was furnished from the main boiler and lines were run directly from tower to boom to drums of engine by lead bars.

Q. 48. You were present, were you not, when Mr. Horton gave his deposition this morning—this afternoon, on being recalled?

A. Yes, sir.

Q. 49. I show you a drawing or sketch and will ask you to state if you know what it is?

Mr. Lyon: Objected to as leading and suggestive, and as incompetent; no foundation laid, and not the best evidence.

A. The drawing I recognize as a sketch similar to the method of the one used in the construction of the concrete cylinders in the docks piers 42 and 44.

Q. 50. You may state whether or not this is the drawing or sketch that was referred to by Mr. Horton in his deposition.

Mr. Lyon: Objected to as leading.

A. This is the drawing referred to by Mr. Horton.

Q. 51. You may state, if you know, who prepared the drawing and also if you know under whose direction it was prepared.

[fol. 669] A. The drawing was prepared by Mr. List, draftsman in the employ of the Healy Tibbets Construction Company, and under the direction of Mr. Horton and Mr. Brown.

Q. 52. Will you go on and describe again the apparatus and system of concrete distribution as it was used in the construction of piers 42 and 44, and in the construction of subsequent work, making reference in your description to this drawing which is before you as you may have occasion?

Mr. Lyon: Objected to as leading and suggestive, and as incompetent; no foundation laid, and as not the best evidence.

A. In explaining the operation of the method used with the floating tower barge with bunker and tower equipped rig, will state that we found this method of operation the best that we had found in any of our work up to that time, and we also used he same method to good success on piers 36 and 38.

Q. 53. I will ask you to refer to the drawing and point out in the drawing what the different figures and illustrations represent, if anything, with relation to the apparatus you have referred to as used in the years 1905 and 1906 and subsequently?

Mr. Lyon: Objected to as leading and suggestive, and as incompetent, no foundation laid, and as not the best evidence, not a proper method of proof.

A. In the working of the tower barge the drawing showing the concrete hoist and the mixer barge, box and retainer when hoisted, the trémie supported by movable boom, also the bunker, mixer and power hoist for handling the trémie and concrete material. The section XX shows support for movable boom, with the bolts can be moved up of our work up to that time, and we also used the same method to [fol. 670] bucket showing at lower end of hoist in place ready to receive mix from mixer. Bunker shown above mixed that deposits batch into mixer. Boiler that furnishes steam for engine that runs mixer, and spools and cables and blocks shown in the handling of boom and tréme pipe. Section showing boom, irons and fasteners are also at

upper end of drawing. That is all there is to describe, as near as I know.

Q. 54. What is the size of the barge, about?

A. The barge is about 24 x 50, and about 6 feet deep.

Q. 55. I notice in the drawing is the marking in the general figure "Barge Hull 20′ x 50′"; have you measured the barge——

Mr. Lyon: This is objected to as leading and suggestive and upon the grounds stated in the objection to Q. 53.

A. I simply stepped off the barge, but took no exact measurements, as the barge was in a bad state from slime and muck and I did not care to get any more on my person than I could help.

Q. 56. And by pacing it——

A. As near as I could recall it was about 20 x 50.

Q. 57. There is a figure marked "Boiler & Engine" in the general view. I understand you to say that this is approximately the location of the boiler and engine as you used it upon the barge.

Mr. Lyon: Same objection as made to the preceding question.

A. As near as I can recall that is about the location of the boiler and engine as when used.

Q. 58. There is a square marked "Bunker" and below it in an oblong figure appears the word "Mixer." I understand from your testimony that the location of the bunker on the barge as used by you was in the position indicated by the word "Bunker" and that the "Mixer" was below it as indicated in the sketch; is this correct?

[fol. 671] Mr. Lyon: Same objection as made to Q. 55.

A. As near as I can recall the bunker as outlined, also mixer, is in the location as when the rig was in operation.

Q. 59. You may state what the central portion of the figure represents.

Mr. Lyon: Same objection as noted to Q. 55.

A. The central figure is the hoist proper, the sheave at the head of the hoist is the lead for the concrete bucket to bring the concrete to the head of the hoist to retain box to be placed through trémie.

Q. 60. How is the trémie illustrated, if at all, in the figure?

Mr. Lyon: Same objection as noted to Q. 55.

A. The trémie held under the retainer box, the lever showing where the gate opens and deposits the concrete in the trémie pipe, and the boom shows on hoist holding trémie pipe in whatever location found necessary.

Q. 61. State whether the different parts illustrated in the drawing represent the apparatus which you actually had in use.

Mr. Lyon: Same objection as noted to Q. 55.

A. The drawing as I see it before me is as near as I can recall a likeness of barge, hoist and boom operation as was used in the erection of the piers 42 and 44.

Q. 62. In the drawing is a figure or portion marked "Operating Platform." What is that figure or part designed to represent?

Mr. Lyon: Same objection.

A. The figure on drawing shows operating platform is the platform that is used for the man at the head of the hoist to trip concrete from hand lever into trémie pipe to be deposited where found necessary.
[fol. 672] Q. 63. By "hoist," did you refer to the tower?

Mr. Lyon: Same objection.

A. By "hoist" I referred to the bucket brought by hoist to top of tower and depositing concrete in retainer box.
Q. 64. Is the operating platform still in existence that you used upon the tower?

Mr. Lyon: Same objection.

A. What is left of the concrete plaform that was used at the head of the hoist still remains with the wrecked concrete tower at our boom in South San Francisco.
Q. 65. Referring to the drawing, will you point out the portion that illustrates the tower?

Mr. Lyon: Same objection as noted to Q. 55.

A. The portion illustrating the tower is the up and down support, showing the X bracing and platform at head of hoist, also sheave for hoisting concrete bucket.
Q. 66. Will you point out in the drawing the boom?

Mr. Lyon: Same objection.

A. The boom as shown on the drawing leading directly out supported by a line and block leading to the head of the tower, then down the back end of the tower directly into the spool of the hoisting engine.
Q. 67. What is it that is illustrated in the drawing that permits the mush or concrete to flow through it by gravity?

Mr. Lyon: Same objection.

A. The cut shows the concrete retainer box and below the trémie pipe being supported by the boom, the pipe being flexible and by the operation of the boom either up and down to make the flow easy to its destination.
Q. 68. Is this conduit which is marked "Slip joint pipe or trémie" illustrated as made in sections?

[fol. 673] Mr. Lyon: Same objection.

A. Yes, it is.
Q. 69. And how are the different sections held together and at the same time made flexible?

Mr. Lyon: Same objection.

A. Each joint as shown on drawing is telescoped by following joints, and are held together by hooks fastened to each section in a way to permit small chains to be placed over hooks to make tight connections, and so on down the line, each joint having an overlap of about 6 inches.

Q. 70. And about how long was the conduit or trémie in the apparatus that you used in building those piers?

Mr. Lyon: Same objection.

A. The trémie used in the operation of those piers was in the neighborhood of 80 feet long, as each section had to go within four or five feet of bottom of cylinders. Cylinders ranged in these piers from 60 to 80 feet long.

Q. 71. Just what means is illustrated in this drawing for receiving the plastic material or mush after the mush has been raised?

Mr. Lyon: Same objection.

A. The receiving box just under the platform where trémie is fastened, as noted hopper at head of hoist.

Q. 72. You have on the drawing the words "Valve Operated from Platform with Lever;" does that indicate the position of the valve of gate by which the mush was let into the chute or conduit, otherwise the trémie?

Mr. Lyon: Same objection, and the further objection as noted that the question assumes that the witness had something to do with the imprinting of the alleged words upon this drawing. Such assumption is not borne out by any testimony of the witness, and there [fol. 674] is no foundation whatsoever for assuming that the witness put the *legions* or words upon this drawing.

A. The words "Valve Operated from Platform with Lever" indicates the valve handler or concrete hopper gate that is moved by either handle to allow concrete from retainer box to pass through trémie to whatever place may be necessary.

Q. 73. Was that a sliding or pivoting gate or otherwise?

Mr. Lyon: Same objection.

A. The gate for hopper is known as a sliding lever gate.

An adjournment was here taken until tomorrow, May 27, 1921, at 10 o'clock a. m.

TRANSCRIPT OF RECORD

SUPREME COURT OF THE UNITED STATES

OCTOBER TERM, 1925

No. 744

CONCRETE APPLIANCES COMPANY AND WILLIAM H. IRSLEY, PETITIONERS,

vs.

JOHN E. GOMERY, JOHN C. SCHWARZE, MICHAEL J. O'HEARA, ET AL.

ON A WRIT OF CERTIORARI TO THE UNITED STATES CIRCUIT COURT OF APPEALS FOR THE THIRD CIRCUIT

PETITION FOR CERTIORARI FILED MARCH 6, 1926.

CERTIORARI GRANTED APRIL 5, 1926.

(30,166)

(30,166)

SUPREME COURT OF THE UNITED STATES

OCTOBER TERM, 1924

No. 307

CONCRETE APPLIANCES COMPANY AND WILLIAM H. INSLEY, PETITIONERS,

vs.

JOHN E. GOMERY, JOHN C. SCHWARTZ, MICHAEL J. O'MEARA, ET AL.

ON A WRIT OF CERTIORARI TO THE UNITED STATES CIRCUIT COURT OF APPEALS FOR THE THIRD CIRCUIT

VOLUME II

INDEX

	Original	Print
Testimony of Fred L. Ayer	680	548
Stipulation re testimony of Edward C. Gerhard	693	556
Stipulation re exhibits	693	556
Notice to take testimony	1	558
Testimony of Charles W. Ellis	2	559
John R. Williams	20	570
Fred Bruner	28	575
Frank I. Ginsberg	41	582
Frederick E. Engstrum	49	588
W. H. Insley	60	594
H. M. Kebby	65	597
Robert Tibbitts	81	607

JUDD & DETWEILER (INC.), PRINTERS, WASHINGTON, D. C., DECEMBER 4, 1924

	Original	Print
Testimony of Charles C. Horton	92	613
Fred L. Ayer	110	624
Notarial certificate	125	634
Plaintiffs' Exhibit N—Drawings of patent in suit and specification of letters patent	127	635
Defendants' Exhibit 36—Amendment to preliminary statement of Arthur L. Smith and certificate thereto	139	635
Defendants' Exhibit 38—Drawing of gallery along new wharf	145	638
Defendants' Exhibit 39—Drawing of outer end of wharf galleries and end dock spouts	147	638
Defendants' Exhibit 63—Preliminary statement of Arthur L. Smith and certificate thereto	149	638
Preliminary statement of Lee Callahan	153	641
Preliminary statement of Theodore Emtman	154	642
Preliminary statement of Lee Callahan	158	644
Defendants' Exhibit 67—Drawings of A. L. Smith patent, device for distributing concrete, and specification of letters patent	161	645
Defendants' Exhibit 68—Letters patent of Theodore Emtman and certificate thereto	169	645
Opinion, Dickinson, J., sur trial hearing on bill	177	645
Opinion, Dickinson, J., sur reargument	186	650
Supplemental finding, Dickinson, J	188	652
Decree	190	653
Bill of costs (omitted in printing)	191	654
Exceptions to taxation of bill of costs	197	657
Opinion, Dickinson, J., sur exceptions to taxation of bill of costs	198	657
Order on exceptions to taxation of bill of costs	200	658
Stipulation re payment of costs	201	659
Petition for and order allowing appeal	203	660
Assignment of errors	204	661
Præcipe for transcript of record	205	661
Clerk's certificate	207	662
Defendants' Exhibit 66—U. S. patent No. 69,375 to Voorhis.	212	666
U. S. Patent No. 243,327 to Toepfer.	216	668
U. S. patent No. 366,468 to Edwards & Kelly	220	670
U. S. patent No. 371,343 to McLennan	228	675
U. S. patent No. 426,301 to Musgrove & Clarke	238	681
U. S. patent No. 445,645 to Simpson	244	684
U. S. patent No. 464,101 to Mayo	250	688
U. S. patent No. 524,984 to Robinson	258	693
U. S. patent No. 556,371 to Rasch	264	697
U. S. patent No. 560,382 to Walsh	278	705

	Original	Print
Defendants' Exhibit 66—U. S. patent No. 582,598 to Bird..	282	707
U. S. patent No. 605,375 to Bellinger	286	710
U. S. patent No. 622,019 to Robinson	292	714
U. S. patent No. 667,335 to Record.	302	720
U. S. patent No. 681,378 to Shoemaker & Willson	310	725
U. S. patent No. 694,579 to Ransome	328	735
U. S. patent No. 702,372 to Montgomery	332	737
U. S. patent No. 714,150 to Clarke.	338	742
U. S. patent No. 718,092 to Clarke.	426	798
U. S. patent No. 721,215 to Metzger	436	804
U. S. patent No. 753,616 to Nicholson	440	807
U. S. patent No. 760,015 to Parker.	446	811
U. S. patent No. 769,126 to Adams.	454	816
U. S. patent No. 830,385 to Wallace.	462	821
U. S. patent No. 862,874 to Beach..	470	826
U. S. patent No. 866,166 to Theiss, Whann & Englisbee	480	832
U. S. patent No. 875,529 to Jochnck	492	840
U. S. patent No. 939,072 to Ney...	502	846
U. S. patent No. 948,723 to Emtman	506	849
U. S. patent No. 969,172 to Lonney.	510	852
British patent No. 1124 of 1864 to Potter	541	872
British patent No. 3107 of 1872 to Ellington & Anderson	555	885
British patent No. 2017 of 1880 to Johnson	563	892
British patent No. 10,380 of 1888 to Ballie	573	899
British patent No. 16,525 of 1895 to Roe	583	906
British patent No. 19,554 of 1903 to Holland	605	923
British patent No. 7307 of 1908 to Gibb	609	925
Proceedings in United States circuit court of appeals for third circuit	621	933
Opinion, Buffington, J.	621	933
Decree	634	940
Order modifying decree	634	940
Clerk's certificate	636	941
Order granting petition for certiorari	637	942

Friday, May 27th, 1921, 10 a. m.

Met pursuant to adjournment.
Same parties present.

Direct examination of witness Brown continued by Mr. Barton:

Q. 74. Reference has been made to a section of the trémie pipe; this section has been sent for and I will ask you to state whether this piece which is now before us is the one referred to?

A. You are talking now of the piece of trémie pipe that we had talked of last evening; the piece of pipe that we were talking of last evening is the piece in question.

Q. 75. You may state again when you got that particular piece and what you did with it on Wednesday last.

A. The piece of pipe in question that I had shown to Mr. Barton on Wednesday last I had taken from barge and placed on bank at the direction of Mr. Barton.

Q. 76. Referring to the sketch or drawing which we had before [fol. 675] us yesterday, you will note that I have had the different figures numbered as "Fig. 1, Fig. 2, Fig. 3, Fig. 4, Fig. 5;" I also have marked on the figure "Defendants' Exhibit San Francisco Barge Apparatus May 27th, 1921," preparatory to offering it in evidence. Will you just state by reference to the designations what each figure in a general way represents?

Mr. Lyon: Objected to as leading and suggestive, incompetent, irrelevant and immaterial, no foundation laid, not the best evidence, no proper foundation laid for the introduction of secondary evidence.

A. Fig. 1 showing operating platform and sheave and lead blocks at head end of tower; also bunker for receiving material and below mixer and boiler and engine. All of the above are on the after end of barge. Fig. 2 shows cut of boom fastenings; also timber that is placed on any section of tower to allow the raising or lowering of boom as found necessary. Fig. 3 shows boom timber as bolted to tower. Fig. 4 shows boom timber in place bolted and with supporting strut in place. Fig. 5 shows view looking down on tower from inside, showing four main supports and section of boom fastenings in place.

By Mr. Barton: The sketch or drawing referred to is here offered in evidence as "Defendants' Exhibit 61, San Francisco Barge Apparatus, May 27th, 1921."

Mr. Lyon: Objected to as leading, incompetent, no foundation laid, and not the best evidence, no foundation laid for the introduction of secondary evidence, and as irrelevant and immaterial.

Mr. Barton: Direct examination closed.

[fol. 676] Cross-examination by Mr. Lyon:

X Q. 77. In what business is the Healy-Tibbetts Construction Company engaged?

A. The general contracting business, such as the building of bulkheads, wharves, bridges, highway work, rock quarries and bunkers, and also general concrete cylinder work.

X Q. 78. After the San Francisco earthquake and fire of 1906 the said Company built a large number of office, store and warehouse buildings in the rebuilding of San Francisco, did it?

A. Yes, general concrete construction and pile driving foundation work.

X Q. 79. How was the concrete on those respective buildings handled and distributed?

A. The concrete in those buildings were handled by different methods, the one found most practical being used. Where a building of any height was under construction, hoist towers and chute pipes were used where found practical.

X Q. 80. And where such hoist towers and chute pipes were used the chute pipes were supported by saw horses or supports resting upon the floor or other stable portion of the structure?

A. Yes, in most cases, but where small pockets in the building were to be filled in some cases a light trémie pipe was used supported from tower by boom.

X Q. 81. Where did you use such pivoted pipe and boom in 1906 or 1907 on buildings?

A. On the buildings—well, I cannot recall at present of any particular building but the Wellman Peck Building on Pine off Market, the Gunst Building, and Tillman and Bendel Building. I made a mistake in the name of a building, in place of the Wellman and Peck I meant Tillman and Bendel.

[fol. 677] X Q. 82. When was this Tillman and Bendel Building erected?

A. The exact date I cannot remember, but shortly after the fire.

X Q. 83. Can you give the year?

A. No, not off-hand I could not, without looking up the records. We built at that time, in the years I would say from 1906 to 1910 a great many buildings, but as to the exact dates I cannot recall at the present time in my mind.

X Q. 84. Then you would not be able to give me the year that any of those buildings were built; is that it?

A. Not off-hand, without looking up the records, to be exact.

X Q. 85. Now, as a matter of fact, did not the Healy Tibbetts Construction Company, where it did not use the wheelbarrow method of distribution of concrete in the erection of concrete building construction work in the years immediately following the 1906 earthquake and fire, simply use a temporary wooden trough supported from the floor of the structure by means of wooden supports?

A. In most cases that was the method used throughout the placing of concrete, but as I stated before, in cases where it was not practical to put in the concrete wooden chute to get into tight places or around

corners, a trémie chute would have been used as it would move and was more flexible to get into corners and places.

X Q. 86. How many floors were there in this Tillman and Bendel Building?

A. As near as I can remember there were six stories, and I also want to state that I am not positive in the number of floors as I was not directly in charge of the concrete construction work of the building.

[fol. 678] X Q. 87. And you are depending upon mere recollection that a trémie pipe and boom were used at all on that building, are you?

A. Just from mere recollection, as I would not have direct charge of that work, but I can recall of such a method being used at times.

X Q. 88. According to your recollection, on which floor in the erection of that building was that used?

A. On that one particular building I cannot recall the floor it was used on, but remember of the pipe and small boom being sent to the work for such a purpose.

X Q. 89. Do you remember actually seeing it in actual use on any one of the floors in that building?

A. No, I cannot positively state that I saw it in operation.

X Q. 90. The same is true, is it not, Mr. Brown, in regard to the Gunst Building?

A. In any of the buildings, yes.

X Q. 91. The reason I put the last question in the manner I did is that Mr. Horton stated that a trough and its support by wooden supports on the floor of the building was the only way that any gravity distribution of concrete was used by the Healy-Tibbetts Construction Company in the building of buildings, and I was wondering if your memory was more clear and definite in regard to this than that of Mr. Horton. If I understand your testimony correctly, it is that you yourself were not directly employed upon any of these buildings; is that correct?

By Mr. Barton: I do not find in Mr. Horton's deposition basis for so broad a statement as is contained in the introductory part of this interrogatory, and therefore object to the same as not accurately stated as to what Mr. Horton says in his deposition.

[fol. 679] Mr. Lyon: Read the question to the witness.

(Question read.)

A. That is correct with one exception: That being in charge of the erecting of derricks and the like for the Healy Tibbetts Company, I was in a way employed all over their construction work, but as for the actual concrete work and the pouring of same through chutes or trémie I had nothing whatever to do, only if called upon to furnish them some equipment.

X Q. 92. How many floors were there to the Gunst Building to which you have referred?

A. As I stated before, as to the number of floors in any of the buildings I cannot state correctly at the present time, as I had noth-

ing whatever to do with the construction end as far as the concrete building was concerned.

X Q. 93. Both the Gunst Building, to which you refer, and the Tillman and Bendel Building occupied relatively large space, did they? In other words, they were large buildings?

A. Yes, both were large buildings.

X Q. 94. And the Healy Tibbetts Construction Company erected quite a number of the larger and more important office, store and warehouse buildings that were erected in San Francisco after the earthquake and fire of 1906, did they?

A. They erected a great many of the buildings as far as the foundation and floors were concerned, and in some cases the complete building, and others the finishing work was completed by other contractors.

X Q. 95. In your last answer when you say "finishing work," you refer to such things as the electric wiring, plumbing, carpenter work, and general finishing work?

A. Yes.

Mr. Lyon: That is all.

[fol. 680] Redirect examination by Mr. Barton:

R. D. Q. 96. Please describe a little more fully the piece of the trémie pipe that is before us. This piece——

Mr. Lyon: Objected to as incompetent, not the best evidence, the said piece of pipe speaking for itself and showing for itself, and as not redirect examination, and as incompetent, no foundation laid.

A. The piece of pipe in question is known as the head end of trémie pipe and is placed directly under receiving hopper when concrete is poured from the concrete hoist into receiver. This section of pipe originally was about 3 feet long, about 13 inches in diameter at the large end, tapering to 8 to 10 inches, each section following it was made of telescoped pipe to fit and fasten the same to avoid waste of concrete or in other words, to save the material from spilling on the way to its destination.

Martin E. Brown.

Fred L. Ayer, the next witness, having been sworn according to law, testifies as follows:

By Mr. Barton:

Q. 1. Please state your name, age, residence and occupation.

A. Fred L. Ayer; 1466 Tenth Avenue, San Francisco; I am in the wood business; I am 53 years of age.

Q. 2. What was your business in 1904, '05, and '06 and '07?

A. Pile driving and bridge work.

Q. 3. And for whom did you work?

A. Principally Healy & Tibbetts.

Q. 4. Are you acquainted with Mr. Charles C. Horton and Mr. Martin E. Brown?

A. I am.

Q. 5. What is the kind of work that the Healy Tibbetts Con-
[fol. 681] struction Company does? Tell in a general way.

A. Well, from grading a lot to building a building; all kinds of bridge work and structural iron work; bridge and pile driving. Also do highway grading work.

Q. 6. How long is it since you worked for the Healy Tibbetts Construction Company?

A. About five years, I think.

Q. 7. Going back to the time of the earthquake and fire, you may state if you remember what work you were doing for the Healy Tibbetts Construction Company.

Mr. Lyon: Objected to as leading and suggestive.

A. Just before the fire I worked for Healy Tibbetts Construction Company on pier 42, I believe, constructing the pier. I think it was 42, if I remember right.

Q. 8. Now, what part did you take in such work; what did you personally do at that time?

A. Well, I done a little of all; I am a pretty handy man and worked at all parts of it; the carpenter end of it as a rule.

Q. 9. What was the construction of pier 42; was it of concrete work or otherwise?

A. It was concrete, what we call a concrete pier.

Q. 10. Just how was the work done; what machinery or apparatus did you have?

A. Pile drivers and scows to handle cylinders. We have to have a false work first; then we drive cylinders, what we call them, and then we fill them with concrete; and in filling them with concrete we have a concrete mixer on a barge and we have an elevator built on the barge to handle the concrete to put it into the different cylinders.

Q. 11. Describe the elevator you have referred to.

A. Well, it is a construction that we made in the plan of a tower, which carries the bucket up to a hopper near the top that they
[fol. 682] dump the rock in, and we have also an engine to hoist the cement up with on a platform, and that is dumped into a hopper with the rock, and that goes down an iron pipe to the cylinders. The pipe was constructed in short lengths. The pipe was handled, you might say, by a boom. If anybody understands construction, that is the outline of it.

Q. 12. Describe the boom more fully.

A. Well, the boom is the bottom end of it, and sets in a hinged socket, I would call it, and the outer end has a sheave in the end of it, the cable runs from the donkey engine to the sheave in the outer end, which is used to handle the pipe that carriers the cement to the cylinders. All the use of this boom is to handle the pipe that carries the cement.

Q. 13. What supported the tower?

A. The tower? I do not get you.

Q. 14. You spoke of the tower; where was the tower placed, on what foundation?

Mr. Lyon: Just a moment. Objected to as incompetent, not the best evidence, no foundation laid for the introduction of secondary evidence, and this objection is reserved and taken to all questions asked and answers given by this witness, without the necessity of hereinafter repeating the same. The objection is reserved in this manner, in order not to further interrupt the testimony of this witness, and with the consent of counsel for defendants.

A. On a barge.

Q. 15. Do you know where the barge is now?

A. I couldn't say where the barge is. You might find out by asking the people where the barge is.

Q. 16. Did you see the barge and apparatus you have referred to before the fire?

A. Yes, sir.

Mr. Lyon: Objected to as leading and suggestive.

[fol. 683] Q. 17. What inspection, if any, did you make yesterday at my request?

A. I looked at the part of the old tower and I see that it was the same construction that we used before the fire.

Q. 18. And was it high tide so that you could not see the barge?

Mr. Lyon: Objected to as leading and suggestive.

A. It was.

Q. 19. Describe what you did see yesterday and describe where the tower was.

A. Well, the tower lies in Healy Tibbetts boom near Kentucky Street. I should judge near 20 or 30 feet of the old construction is intact now. That means a part of the tower. I looked it over and satisfied myself that it was the same tower that we used on the barge for handling concrete.

Q. 20. You mean the same tower you used on the barge back in 1906?

Mr. Lyon: Objected to as leading.

A. Yes.

Q. 21. We have before us a piece of material, and I will ask you to state what it is.

A. A jointed pipe which was used as the first joint below the hopper.

Q. 22. When was it used?

Mr. Lyon: That is objected to as incompetent, no foundation laid.

A. I would say we used the same piece or similar to that one in all our work. We couldn't do without one.

Q. 23. At what time?

A. In handling the concrete for building material on piers 43 and 45—no, piers 42 and 44.

Q. 24. And what was the year?

A. 1905 and 1906. We have used them since then.

[fol. 684] By Mr. Barton: The piece of pipe referred to is offered in evidence, to be marked "Defendants' Exhibit 62, Piece of Pipe."

Mr. Lyon: Objected to as incompetent, no foundation laid, as fragmentary, not the best evidence, not the proper method of proof, is irrelevant and immaterial.

Q. 25. I wish you would describe more in detail the manner in which the concrete was handled in the construction of piers 42 and 44.

A. Well, it was brought to the pier—the rock for the concrete—on barges, and put in hoppers, carried to the top of the tower, where it was mixed with cement, and poured down a lengthy pipe to the different cylinders. The pipe was taken off as the cylinders were filled, that is, the pipe is disconnected as the cylinder is being filled, and this pipe is carried around to three or four different cylinders before the tower has to be moved. The rock is carried up one shaft and the cement is carried up in slings to a platform on top of the tower. That is about all I know to explain about it, but I can draw a picture of it.

Q. 26. Referring to the barge on which the tower was placed, I will ask you what there was at the foot of the tower; that is, on the level with the deck or top of the barge.

A. Well, for one thing, there was a donkey engine on there used for hoisting purposes.

Q. 27. And what else?

A. The concrete mixer was there, and a centrifugal pump, and clam shell, and two or three big iron buckets, and wooden tubs; that is about all we used in digging out a cylinder.

Q. 28. And where was the mixer placed with respect to the tower or near to it?

[fol. 685] As near as I remember it was pretty close to the tower.

Q. 29. What was done with the mixer?

A. Well, we used it to mix concrete with.

Q. 30. And after the concrete was mixed by the mixer, what was done with it at first?

Mr. Lyon: Objected to as leading and suggestive.

A. Well, the first concrete we used is lowered down to the bottom of the cylinder placed in a square box for the foundation of the cylinder.

Q. 31. I was referring to the mixer on the barge. You have said that the mixer was used for mixing the concrete; I understand it was mixed into a mush. How did the mush get out of the mixer?

Mr. Lyon: Objected to as leading and suggestive and assuming facts not testified to by the witness.

A. The mixer being in action the concrete would surely go out.

Q. 32. And where did it go to?

A. This mixer was set on a platform at the top of the tower for mixing a portion of the mush.

Q. 33. Do you mean at the top of the tower or at the foot of the tower?

Mr. Lyon: Objected to as leading and suggestive, and an obvious attempt to change the testimony given by the witness.

A. One particular job we had the mixer part way up on the tower or near the top, on a platform where the rock from the hopper run into the mixer and cement was put in and the mixer in action it emptied into a pipe which carried it to the cylinders, and afterwards we had a mixer at the bottom of the tower or near the tower where the concrete was mixed and hoisted to the hopper and that was [fol. 686] emptied into the pipe which carried the cement to the cylinders.

Q. 34. I will ask you if, when the mixer was placed at the foot of the tower, the cement or mush went first from the mixer into a bucket or skip?

Mr. Lyon: That is objected to as leading and suggestive.

A. It did. It was carried up the center of the tower.

Q. 35. When this skip or bucket with the mush was carried up to the top of the tower, what was done with the mush?

Mr. Lyon: That is objected to as assuming facts not testified to by the witness.

A. It was emptied into a hopper, which was connected with the pipe, which carried it to the cylinders.

Q. 36. How was the mush after it was in the hopper allowed to get into the pipe?

A. Well——

Mr. Lyon: Same objection.

A. It had a small slide on the bottom of the hopper which was open and shut at the will of the man handling the pipe.

Q. 37. Where was the man placed that was handling the pipe; where did he stand?

Mr. Lyon: Same objection.

A. Near the hopper.

Q. 38. How did he know when to open the slide and when to close it?

A. He had signals from the man in the cylinder; he has a line to give signals to the man handling the chute, or in charge of the chute.

Q. 39. About what was the diameter and length of these cylinders? [fol. 687] A. As near as I remember, they run from 48 to 60 feet, there might have been some a little longer. It is quite a long time ago and I have forgotten just the length of the cylinders.

Q. 40. About what was the diameter?
A. I think an average of 5 feet.
Q. 41. I understand that there was a man down in the cylinder as the concrete was being placed and that this man down in the cylinder would give the signal to the man on the platform to open the gate; is that correct?

Mr. Lyon: Objected to as leading and suggestive.

A. It is, as I stated before.
Q. 42. About how large was the barge on which this tower and other apparatus were placed; how long was it, about, and about how wide and about how deep, according to your best recollection?
A. About 30 feet wide, and about 60 feet long, and about 8 feet in depth, as near as I remember. It might have been a little larger, but I don't think it is any smaller.
Q. 43. How long did you work about that barge and about placing the cement in the cylinders?
A. Well, the first time I think about six months; the second time about four. If it was necessary I guess the company's time book would show how much time was put in.
Q. 44. What was the time of the first six months? What year?
A. In 1905.
Q. 45. And what was the year about four months?
A. In 1906.

Mr. Lyon: Let the record show that at this point counsel for defendants places before the witness a drawing which has been [fol. 688] marked "Defendants' Exhibit San Francisco Barge Apparatus, May 27th, 1921." We object on the ground that it is calculated to further educate the witness for his further testimony in this case. It is clearly an improper proceeding.
The Witness: Take it away. This is the first time I ever saw that. I will draw one.

Q. 46. Are you accustomed to making drawings and to working from drawings?
A. I am not accustomed to making drawings, but I am accustomed to working from drawings.
Q. 47. I ask you to look upon this drawing which is now before you and state what it represents so far as you understand it.
Mr. Lyon: Objected to as incompetent, no foundation laid, not the proper method of proof, not the best evidence, no foundation laid for the introduction of secondary evidence, and an evident attempt to place before the witness exactly what it is that the witness is expected to testify to.
A. I would say this is a tower that would carry mixed concrete to cylinders with. The object in having a long pipe of this kind is so that there will not be too much concrete go into the cylinders at one time; it has to go in in small proportions. It has a boom to handle the pipe, so that it can fill several cylinders in the radius around that the pipe will reach to without moving the barge. The cylinders are not allowed to be filled full at one setting, so we drop

the cement in and get them up a certain height in each cylinder, and after standing so long they are refilled. That is about all.

Q. 48. Referring to this sheet of drawing, I will ask you whether or not the drawing illustrates the apparatus such as was used by [fol. 689] you in 1905 and 1906 in building towers—piers 42 and 44.

Mr. Lyon: That is objected to as leading and suggestive and incompetent, no foundation laid, not the best evidence, no foundation laid for the introduction of secondary evidence; calling for the conclusion of the witness and not for a statement of facts, and not a proper method of proof.

A. Yes. This is the same apparatus or similar to the one used.

Q. 49. You told me you were in the wood business; just what is your work in that connection now?

A. Buying the wood and selling it, and getting the money.

Q. 50. Do you saw it up?

A. I have men to saw it.

Q. 51. When I first met you you were helping the men haul the wood, were you not?

A. Yes.

Mr. Barton: That is all.

Cross-examination:

Mr. Lyon:

X Q. 52. What other piers did you work on for the Healy Tibbetts Construction Company besides piers 42 and 44?

A. Well, I have worked on several; I think 46, and I believe 53, and I was hurt on pier 13. Well, I would state that I have been working off and on for Healy Tibbetts Construction Company for twenty-five years.

X Q. 53. What year did you work on pier 46?

A. I couldn't say without looking up the records.

X Q. 54. What year did you work on pier 53?

A. I believe it was '14 or '15, as near as I remember.

X Q. 55. Was that pier built with concrete cylinders?

A. Yes.

X Q. 56. In building that pier, did you use a barge with a tower? [fol. 690] A. I don't just remember, but I could give you a little information about when we did use the tower.

X Q. 57. Did you work on pier 36?

A. I believe I did.

X Q. 58. Was that pier built in 1903?

A. I don't think it was; couldn't say offhand.

X Q. 59. Did you work on pier 38?

A. Yes, I did pier 38.

X Q. 60. Was that built in 1904?

A. I don't remember.

X Q. 61. Did either piers 36 or 38 have concrete cylinders?
A. Yes, sir; 26 had concrete cylinders.
X Q. 62. Well, how about pier No. 36?
A. Not having had charge of work on pier 36 I don't remember just the time it was built,
X Q. 63. Did you work on it?
A. I think I did; I am pretty sure I did. If I really knew what I came here for I could have brought the time book.
X Q. 64. Now, with whom have you talked regarding this old work before you started in to testify this morning? With Mr. Barton and with Mr. Martin E. Brown, and with Mr. Charles C. Horton of the Healy Tibbetts Construction Company?
A. Not any in regard to this testimony.
X Q. 65. You did talk, however, with them regarding this old barge down in the boom yard or whatever you call it of the Healy Tibbetts Construction Company, did you?
A. No, sir.
X Q. 66. You didn't talk with either Mr. Brown, Mr. Barton or Mr. Horton in regard to that?
A. No, sir.
X Q. 67. Say anything about that apparatus?
[fol. 691] A. No.
X Q. 68. You were here in attendance yesterday, were you?
A. Yes, sir.
X Q. 69. Did you go out to the boom yard or whatever you call it this morning?
A. No, sir.
X Q. 70. You didn't bring in this old piece of pipe?
A. I had it brought in.
X Q. 71. How did you come to have it brought in?
A. At the request of Mr. Barton. I came here straight from home this morning.
X Q. 72. Then you did have some talk with Mr. Barton regarding that old apparatus yesterday, did you?
A. I did, yesterday.
X Q. 73. And who else beside Mr. Barton had you talked with either yesterday or Wednesday regarding that old apparatus?
A. Mr. Brown asked me if — would go and see if that was the same rig that we had years ago; that is all the talk I had with Mr. Brown.
X Q. 74. According to your recollection, did you find all of the rig there?
A. No, sir. There was a dilapidated portion of it there.
X Q. 75. There is no portion of the boom there, is there?
A. It was high tide when I was at the boom and I don't really know. I was at the boom on business of my own.
X Q. 76. When you used "boom" in the last answer, you do not refer to the alleged boom of this apparatus, but refer to the boom in the sea sense, as where the old apparatus is confined within the boom; is that correct?
A. Where the pile drivers and logs are kept is called a boom.

[fol. 692] X Q. 77. Then you are unable to state just how much of this old apparatus does now exist; is that correct, Mr. Ayer?

A. Yes, but there is enough there to show that it is the original tower.

Mr. Lyon: That is all.

Mr. Barton: Commission closed. Certificate of the magistrate is waived by counsel.

Fred L. Ayer.

[fol. 693] STIPULATION RE TESTIMONY OF E. C. GERHARD

It is hereby stipulated and agreed by and between counsel for the respective parties that if E. C. Gerhard were to be recalled as a witness for defendants, he would testify that the Franklin School Contract was let June 28, 1909; and that the apparatus shown in Plaintiffs' Exhibit No. 31 was put into use in said building operations prior to January 1, 1910.

July 25, 1921.

STIPULATION RE EXHIBITS

It is further stipulated that Exhibit 52 was published August 12, 1915, and that the publications, from which the excerpts comprising Exhibit 64 were taken, were published on the respective dates appearing on said excerpts.

By Mr. Jones: Counsel for defendants offers in evidence the exhibits marked for identification in the foregoing depositions, i. e., Exhibits 1 to 34, inclusive; 36 to 45, inclusive; 50 to 62, inclusive, and additional exhibits marked as follows:

63, Certified Copies of Preliminary Statements in Two interferences.

64, Partial Copies and Reproductions of Miscellaneous Publications.

65, Certificates of Clerks of Courts.

By Mr. Hood: Plaintiffs object to the several exhibits offered in evidence by defendants as follows:

The objections heretofore entered of record as to any of the aforesaid exhibits are hereby repeated.

Exhibit No. 1 is objected to as irrelevant and immaterial because relating to a structure subsequent to the date of the Callahan invention.

Exhibit No. 2 is objected to as irrelevant and immaterial because [fol. 694] relating to a structure subsequent to the date of the Callahan invention.

Exhibit No. 3 is objected to as irrelevant and immaterial because relating to a structure subsequent to the date of the Callahan invention.

Exhibit No. 4 is objected to as not the best evidence; not properly proven.

Exhibit No. 8 is objected to as not the best evidence and not properly proven or pleaded.

Exhibit No. 9 is objected to as not the best evidence and not properly proven or pleaded.

Exhibit No. 12 is objected to as irrelevant, immaterial and not properly pleaded.

Exhibit No. 13 is objected to as not the best evidence and not properly proven.

Exhibit 14 is objected to as irrelevant and immaterial because relating to a structure subsequent in date to the date of the Callahan invention.

Exhibit No. 16 is objected to as not the best evidence and not properly proven.

All of Exhibit 17 except photograph A is objected to as irrelevant and immaterial because relating to structures subsequent in date to the date of the Callahan invention.

Exhibit 18 is objected to as not the best evidence and not properly proven.

Exhibit 19 is objected to as not the best evidence and not properly proven.

Exhibit 20 is objected to as not the best evidence and not properly proven.

Exhibit 21 is objected to as not properly pleaded.

Exhibit 22 is objected to as irrelevant and immaterial because relating to structures subsequent in date to the date of the Callahan invention.

Exhibit 23 is objected to as not the best evidence and not properly proven.

[fol. 695] Exhibit 24 is objected to as not the best evidence and not properly proven.

Exhibit 25 is objected to as irrelevant and immaterial because subsequent in date to the date of application of the Callahan patent in suit and as not pleaded.

Exhibit 26 is objected to as irrelevant and immaterial because relating to transactions subsequent in date to the date of the Callahan invention.

Exhibit 27 is objected to as irrelevant and immaterial because relating to transactions subsequent in date to the date of the Callahan invention.

Exhibit 28 is objected to as irrelevant and immaterial because relating to transactions subsequent in date to the date of the Callahan invention, and not properly pleaded.

Exhibit 29 is objected to as irrelevant and immaterial, not pleaded and not properly proven.

Exhibit 30 is objected to as irrelevant and immaterial, not pleaded and not properly proven.

Exhibit No. 31 is objected to as not pleaded and irrelevant and immaterial because relating to a structure subsequent in date to the date of the Callahan invention.

Exhibit No. 32 is objected to as not the best evidence and not properly proven.

Exhibit 33 is objected to as irrelevant and immaterial.

Exhibit 34 is objected to as not the best evidence, not properly proven and not pleaded.

Exhibit 36 is objected to as not the best evidence and not properly proven.

Exhibit 37 is objected to as not the best evidence and not properly proven.

Exhibit 39 is objected to as not properly pleaded.

Exhibit 40 is objected to as irrelevant, immaterial, not pleaded or proven.

[fol. 696] Exhibit 41 is objected to as irrelevant, immaterial and not properly proven.

Exhibit 42 is objected to as irrelevant, immaterial and not properly proven.

Exhibit 43 is objected to as irrelevant, immaterial and not properly proven.

Exhibit 50 is objected to as irrelevant and immaterial because relating to the structures subsequent in date to the date of the Callahan invention; and not proven.

Exhibit 51 is objected to as irrelevant and immaterial because relating to the structures subsequent in date to the date of the Callahan invention; and not proven.

Exhibit 52 is objected to as irrelevant and immaterial because subsequent in date to the date of the patent in issue; and not pleaded.

Exhibit 53 is objected to as irrelevant and immaterial because subsequent in date to the date of the Callahan invention; as not the best evidence and as not proven.

Exhibit 54 is objected to as not properly pleaded.

Exhibit 55 is objected to as not properly pleaded.

Exhibit 56 is objected to as not properly pleaded.

Exhibit 57 is objected to as not properly pleaded.

Exhibit 64 is objected to as irrelevant and immaterial insofar as any of the excerpts therein are subsequent to January 21, 1909, the date of application of the Callahan patent in suit.

[fol. 1] IN UNITED STATES DISTRICT COURT

[Title omitted]

NOTICE OF TAKING TESTIMONY—Filed December 2, 1921

Philadelphia, Pa., November 28, 1921.

Please take notice that on Wednesday, November 30, defendants will take testimony at the offices of Gillford & Bull, 141 Broadway,

New York, beginning at 10 o'clock A. M., before a competent Notary and continuing until the testimony is finished.

The witness will be C. W. Ellis, of the Reynolds Electric Company, 1123 Broadway, New York.

You are invited to attend and cross-examine.

Wm. Steell Jackson, Solicitor for Defendants.

To Cyrus N. Anderson, Esq., Solicitor for Plaintiffs, 1011 Chestnut Street, Philadelphia, Pa.

This twenty-eighth day of November, 1921, I acknowledge service of the above notice of taking testimony and receipt of a copy thereof.

Cyrus N. Anderson, Solicitor for Plaintiffs.

[fol. 2] New York, November 30, 1921—10 a. m.

Depositon of C. W. Ellis, taken in sur-rebuttal, on behalf of the defendants, at the office of Gillford & Bull, No. 141 Broadway, New York City, pursuant to the annexed notice, before C. E. Davidson, a notary public.

Present: Thomas H. Sheridan, Esq., on behalf of defendants; Cyrus N. Anderson, Esq., on behalf of plaintiffs.

Q. 1. Give your name, age, residence and occupation?

A. Charles W. Ellis; age 49; 278 Magnolia Avenue, Jersey City, N. J.; occupation, salesman.

Q. 2. Were you ever associated with Concrete Appliances Company, complainants in this case?

A. Yes.

Q. 3. When were you associated with this company?

A. I went with this company in the spring of 1910 and stayed with them until the fall of 1912.

Q. 4. What was the nature of your occupation?

A. I was engaged as a sort of a managing engineer to get together the different vague ideas of the gravity system which several of their foremen had, and then I was used as promoter and salesman in putting this system on the market, in introducing the G Y system of distributing concrete in building construction by gravity. This was handled by shooting the concrete through pipes and afterwards through open troughs.

Q. 5. I call to your attention catalogue of complainant company. [fol. 3] Defendant's Exhibit 59, and ask you if this is the structure which you have mentioned?

A. Yes.

Mr. Anderson: This line of examination is objected to for the reason that it does not appear to be sur-rebuttal testimony or even leading to sur-rebuttal testimony, and furthermore is entirely without the scope of the motion for leave on the part of the defendants to take sur-

rebuttal testimony, in support of which the deposition of this witness is being taken.

Q. 6. Did you have anything to do with the preparation of this catalogue?

Mr. Anderson: Objected to for the same reason as above noted, and as immaterial and irrelevant.

It is agreed that counsel for plaintiff may reserve his objections to questions of this character until some later period during the examination of the witness after this line of examination has been completed.

A. I am personally responsible for the making and issue of this catalogue.

Q. 7. I hand you herewith a copy of patent to Callahan 948,719, and of patent to Emtman, 948,723, and ask you if you know or have known the inventors thereof?

A. Yes. I was acquainted with Mr. Callahan, who was a sub-foreman of the F. O. Engstrum Company and Mr. Emtman was a general foreman.

Q. 8. Was there any relation between the Engstrum Company and the Concrete Appliances Company?

A. The Concrete Appliances Company was practically a subsidiary of the Engstrum Company, all bills were paid by the Engstrum Company.

[fol. 4] Q. 9. What was the business of the Engstrum Company?

A. General contractors, specializing in reinforced concrete construction.

Q. 10. What officers or executives of these companies were you in contact with?

A. I was in contact with Mr. Hugh Bryson and reported to him directly and to no one else, although Mr. Fred Engstrum occasionally would have conferences with me relative to the general situation, as well as Mr. F. O. Engstrum, senior. He died recently.

Q. 11. What do you mean by "general situation"?

A. They were always interested to know what the attitude of the other contractors was toward the Concrete Appliances Company.

Q. 12. What was Mr. Bryson's position with these companies?

A. I believe he was general manager of the F. O. Engstrum Company. He had some office with the Concrete Appliances Company.

Q. 13. What authority did Mr. Bryson have with respect to this gravity system?

A. As far as I was concerned, he had the final say with regard to the policy and decision in all matters.

Q. 14. Did he have anything to do with the patent matters of the company?

A. He was always extremely interested in all patent debates and information.

Q. 15. Did he ever discuss the patentability of this gravity system with you?

A. Yes, he discussed it, but he left this practically up to Mr. Hackley, of Townsend, Lyman & Hackley, who is now deceased, I believe, and myself.

Q. 16. Did you ever have occasion to investigate prior uses of a similar structure?

[fol. 5] A. Yes.

Q. 17. Please explain your answer more fully?

A. As is quite natural, being a promoter, I was instructed and always had my eyes open, when I was travelling around the country for anything which might show priority use.

Q. 18. Did you come across any structures which you considered to be prior uses? By structures I mean apparatus for concrete distribution.

A. Yes, I ran across two claims of priority, one by the Healy-Tibbitts Company of San Francisco, and the Great Lakes Engineering Company, Chicago.

Q. 19. Please explain the circumstances attending this Healy-Tibbitts prior use?

A. I ran into the Healy-Tibbitts proposition on one of my visits to San Francisco when I was soliciting business for the Concrete Appliances Company.

Q. 20. Please explain fully the facts of this location of the Healy-Tibbitts prior use?

A. The engineer of the Healy-Tibbitts Company at that time informed me that they had been using this method of distributing concrete in the construction of docks on some Government work prior to the San Francisco fire or earthquake and used it very extensively after the earthquake on the rebuilding and repairing of docks which were destroyed.

Mr. Anderson: This answer is objected to because it, obviously, is based entirely upon hearsay and must of necessity be incompetent. Furthermore, the examination of this witness with respect to the alleged prior Healy-Tibbitts Company's use is objected to because it would seem to be perfectly apparent that this witness can know nothing of his own knowledge with respect to such alleged prior use.

(Witness continues:) To further prove that he was not comment-
[fol. 6] ing upon his ideas of what constituted a gravity system, he gave me the address of a barge which was then tied up at a dock as they were not using the same. I went down and looked this apparatus over and found that it embodied the general features of the G Y system, the barge having a tower of about thirty feet, a concrete hoist, hopper, and about twenty feet of pipe which was so attached that it could be swiveled from the discharge end of the hopper, together with other apparatus which was not assembled.

Q. 21. Did you make any drawings or other illustrations of this structure?

A. No, at that time I took a photograph of the structure and wrote the company the situation.

Q. 22. Did you discuss this prior use with Mr. Bryson or others of your company?

A. Yes, I went over the situation with Mr. Bryson and Mr. Emtman.

Q. 23. What was the attitude of Mr. Bryson with reference to this Healy-Tibbitts apparatus?

By Mr. Anderson: Objected to as irrelevant and immaterial.

A. He, as well as the rest of us, did not see at that time that it had a direct bearing on building construction.

Q. 24. Did he recognize that the structural features of this Healy-Tibbitts apparatus were similar to those of your gravity system, ignoring the possible difference in application, as between marine—such as dock work—and building construction?

By Mr. Anderson: Objected to as incompetent because it would seem to be apparent that this witness is not in a position to express an opinion as to what might have been or might not have been recognized by Mr. Bryson.

A. Yes, I believe he did.

[fol. 7] Q. 25. During your association with the Concrete Appliances Company did they, to your knowledge, sell any gravity system to the Healy-Tibbitts Company?

A. No, they did not.

Q. 26. Would you presumably have known of such sales had they been made?

A. Yes.

Q. 27. Did your company, to your knowledge, license Healy-Tibbitts Company to use their apparatus?

A. No.

Q. 28. I call your attention to the Callahan & Emtman patents previously shown you, and ask you if either illustrates the structure being sold or used by the Concrete Appliances of Engstrum Company?

By Mr. Anderson: Objected to as incompetent and immaterial, and as not sur-rebuttal.

A. Fundamentally they cover the apparatus, but not in detail. During my connection with the Concrete Appliances Company the apparatus used varied in detail from what is shown in these patents.

Q. 29. Ignoring the details of construction, which of these two patents illustrates the construction utilized by your company during your employment?

A. The patent of Theodore Emtman.

Q. 30. Was the structure shown in the Callahan patent utilized during your employment?

A. No.

By Mr. Anderson: Question and answer objected to as being incompetent in that it calls for an expression of opinion of the witness, and he has not been qualified as a witness competent of expressing such opinion.

Q. 31. Did you have any engineering education or experience before your association with Concrete Appliances Company.

A. Yes, I graduated at the University of Michigan in mechanical [fol. 8] and electrical engineering. Have had extended experience in the designing of engineering apparatus used in construction work, such as concrete pile engineering and concrete block construction.

Q. 32. Was any difficulty experienced in the use of the gravity system during your association with this company?

A. Yes, naturally. We experienced all the troubles which a new industry goes through in the process of evolution, such for instance, as the falling down of towers, the breaking of booms, congestion and uselessness of pipes, and the eventual success of the open trough.

Q. 33. Was the adoption of the open trough during your association with the company?

A. Yes, sir.

Q. 34. Can you give the year, or approximate time of this adoption, or the job?

A. It was while I was in Chicago in consultation with the Witherspoon-Englar Company, due to the failure of several jobs which they were operating on the closed pipe, that I received the wire from Los Angeles that Mr. Snooks, foreman at that time on the—I believe—the Timpkin Building at San Diego, had overcome this congestion by converting his pipes into troughs.

Q. 35. During your association with this company were there any instances of adoption of similar apparatus by parties not purchasing from your company or recognizing their rights?

A. Yes, the Fellowes Construction Company, I believe, construction a pre-cooling plant at Barstow, California, used our apparatus, or rather our system, but did not buy the apparatus from us, or did not lease from us the use of the system.

Q. 36. Was any prosecution made of this company?

[fol. 9] A. No.

Q. 37. Were there any instances during your employment of purchase or lease of its apparatus which was rejected or removed on account of dissatisfaction or failure?

A. Yes.

By Mr. Anderson: Protest is made against this entire line of examination because it clearly is not sur-rebuttal testimony, but on the contrary relates to matter which should have been introduced, if at all, by the defendants prior to the trial of this suit and within the period during which they took their original testimony, and because this appears to be an attempt practically to re-open the entire case.

Q. 38. Please specify, if you recollect, any such instances?

A. There were several instances during the evolution of this system where we had secured leases, but due to failure of detail construction the apparatus was a failure, and naturally we were not in a position to exact payment for the same. One such job was the Hess job in Los Angeles, as I recall it. Another one was on the leading hotel at Fresno.

Q. 39. Was Fred Engstrum, to your knowledge, traveling about and in contact with the various jobs utilizing this gravity system?

By Mr. Anderson: Objected to as immaterial.

A. Only in Los Angeles.

Q. 40. Can you approximate the dates when this catalogue was prepared and published?

A. In the year 1910, I think it was the fall. The dates of the testimonials there show 1910 and they were taken or secured at the time for the issuing of the catalogue.

[fol. 10] Q. 41. In your answer to Q. 4 you answered that you were engaged to get together the different vague ideas that the various foremen had with respect to this gravity system. Did you have anything to do with the design of the apparatus in this connection?

By Mr. Anderson: Objected to as immaterial.

A. Yes, I worked with Emtman and also consulted the different sub-foremen as to any objections they might have to the existing apparatus, with the idea of improvement. I personally did all the detail in the drafting and designing of the aparatus for the same.

Q. 42. Do you remember the year in which you located this Healy-Tibbitts prior use?

A. I think it was the spring or summer of 1911.

Q. 43. I hand you herewith drawings and blueprints of Defendants' Exhibit 41, and ask you if you recognize the same?

A. Yes, these were all made by me with the exception of the sheet entitled "Filtration plant, Grand Rapids, Mich.," which is signed "CNS of January 11, 1911."

Q. 44. Is there any notation or inscription on these prints or drawings which identifies them as having been made by you?

By Mr. Anderson: Objected to as immaterial.

A. These drawings are all signed by me with my initials and are also my own handwork.

Q. 45. What was your practice as to dating such drawings—that is, were they dated when you made them or——

A. They were dated the day of making them.

Q. 46. Were you familiar with the William B. Hough Company?

[fol. 11] By Mr. Anderson: Objected to as immaterial.

A. Yes.

Q. 47. Did you have any contact with this Hough Company?

A. Yes, I practically selected the Hough Company.

Q. 48. Did the Hough Company meet with difficulty in the handling of this gravity system?

A. Yes. As above referred to, on the Sweetwater job of the Whitherspoon-Engel Company, and on several other jobs.

Q. 49. Where was the Sweetwater job?

A. At Sweetwater, Texas.

Q. 50. Did you have anything to do with this Sweetwater job?
A. I was sent down there due to trouble they were having on the pipes, that is all. That was handled by the Hough Company, the layout and everything was made by the Hough Company.
Q. 51. Was the apparatus at Sweetwater retained or discarded?

By Mr. Anderson: Objected to as immaterial.

A. I believe it was discarded.
Q. 52. What was the financial condition of the Engstrum Company at the time of your association with them?

By Mr. Anderson: Same objection.

A. A-1, Bradstreet. They were doing about two and a half million dollars a year contracting work.

(Direct examination closed.)

By Mr. Anderson: In accordance with previous understanding, which will be found above, objection is now made to this entire examination for the principal reason that it is in no way proper sur-rebuttal testimony, and has little or no bearing upon the par-
[fol. 12] ticular matters referred to in the affidavit of George B. Jones, Esq., in support of the motion for leave, on the part of the defendant, to take sur-rebuttal testimony, which motion was heard in the District Court in Philadelphia, Monday, November the 28th.
(Objection is further made on the ground that the testimony of the witness is irrelevant and immaterial.)
(Objection is further made to the preamble to this deposition on the ground that it purports to be taken in sur-rebuttal, whereas leave was given by the Court only to take it in support of the motion for leave to take sur-rebuttal.)
(Notice is now given that at or before the rehearing upon the motion for leave to take sur-rebuttal testimony, motion will be made to strike this deposition from the record.)

Cross-examination by Mr. Anderson without waiving the objections to the testimony as given, or the protest to the taking of the same.

By Mr. Sheridan: It is noted on the record that the deposition of this witness has been given under oath and notice is hereby given that such deposition will be relied upon with the same force and effect as if made in the form of an affidavit in support of motion to take sur-rebuttal testimony and the permission of the Court will be asked to utilize this testimony as sur-rebuttal, if such permission is granted in order to minimize the cost so far as possible.

X Q. 53. Other than the Exhibits No. 41 and 59, have you referred to any written memoranda or data in connection with or in support of the testimony above given by you?
[fol. 13] A. Yes, I have recently gone over some of the testimonies that have been given by some of the other witnesses.

X Q. 54. But that was prior to the beginning of your testimony this morning?

A. Yes.

X Q. 55. You have not referred to or consulted any written original memoranda of your own, have you?

A. No.

X Q. 56. Then, for the most part, your testimony today is based entirely upon recollection?

A. Yes, with two exceptions. I looked up last night and found a couple of receipts and the record of the approximate time of my employment with the Concrete Appliances Company.

X Q. 57. I think you said that on the barge which you saw in San Francisco, the tower was about thirty feet high. And the pipe or chute about twenty feet long, I believe you said. Was that barge and tower in use at that time?

A. No.

X Q. 58. Did it appear as though recently used?

A. It had not been recently used—I could not judge the time.

X Q. 59. Was that in 1911 or 1912?

A. That was in 1911.

X Q. 60. What time?

A. I believe it was in the spring or summer, as near as I can remember.

X Q. 61. While you were with the Concrete Appliances Company do you know whether or not that company had licensees who were operating under its patents?

A. Yes.

X Q. 62. Do you know who some of those licensees were?

[fol. 14] A. Arthur S. Bent Company, who rebuilt the Sweetwater Dam at Sweetwater, California, was one, and the Washington Water Power Company at Spokane, Wash., was another. There were several others but I don't recall their names.

X Q. 63. The Parrott Company was a licensee?

A. They were our agents.

X Q. 64. As I understand it, you knew nothing of that barge and the tower with the chute on it, except what you saw when you visited it during the period of our employment by the Concrete Appliances Company.

A. That is correct, only the word of the engineer of the Healy-Tibbitts Company.

X Q. 65. And as far as you know, the tower and chute which you saw may never have been used?

A. I never saw it in actual operation, the conditions showed use, however.

X Q. 66. Do you recall how that pipe or chute was supported?

A. Not definitely, no. I would not know unless I had seen it in actual operation how it was supported.

X Q. 67. And you don't recall the construction of that pipe either, do you?

A. I paid no attention to any detail, as at that time I was only interested in the general principles of the proposition.

X Q. 68. And if the apparatus which you saw at that time had been previously used, you have no knowledge as to how or for what it was used, is this not so?

A. Yes, the engineer of the Healy-Tibbitts Company told me that this apparatus had been used and was especially efficient in the pouring of the concrete for the floor of the docks, I distinctly recall this point for the reason that I was extremely interested in finding [fol. 15] out how they constructed their cribbing over the water for the placing of steel and pouring of the concrete.

By Mr. Anderson: Answer objected to as hearsay.

(Recess until 1 p. m.)

X Q. 69. In the years 1910 and 1911 while you were with the Concrete Appliances Company, that company was putting out this gravity distributing concrete apparatus, was it not?

A. Yes.

X Q. 70. And, as far as you know, had been putting it out for a period prior to the time that you went into its employ, had it not?

By Mr. Sheridan: Objected to as calling for hearsay evidence.

A. No, all licenses issued were after my connection with the Concrete Appliances Company.

X Q. 71. Is it not possible that apparatus of the character in question could have been furnished to the Healy-Tibbitts Company by the Parrott Company without your knowledge?

A. Possible, but not probable, because the record of all sales and inquiries were sent to me personally for correction and passing.

X Q. 72. Are you prepared to say that the Parrott Company might not have furnished the Healy-Tibbitts Company in the year 1910 with the drawings and specifications of such apparatus?

A. They could not have done this without violation of our contract with them as our agents.

X Q. 73. Do you mean that even if the Parrott Company had had in its possession drawings and specifications furnished by Concrete Appliances Company, it could not have turned them over to the Healy-Tibbitts Company?

[fol. 16] A. Such a thing is possible, I don't see that it was necessary, for the reason that we had been advertising in detail the construction of the G Y system in the Engineering News and the Architect & Engineer, a magazine published in San Francisco.

X Q. 74. As far as you know, that tower and chute which you saw on the barge in San Francisco in 1911, if used at all, might have been constructed and used in the years 1908 or 1909, might it not?

A. It is possible.

X Q. 75. Do you know when that Sweetwater, Texas apparatus was used that you referred to a while ago?

A. I think that was in 1911—I am not positive of that.

X Q. 76. You said that apparatus was discarded, why was it discarded?

A. Due to failure of detail of construction, principally due to the attempts to use pipes instead of troughs.

(Cross-examination closed.)

Redirect examination by Mr. Sheridan:

R. D. Q. 77. In cross-examination you have referred to royalties paid by several companies to Concrete Appliances Company. Have you any knowledge or recollection as to the amounts of these royalties?

A. At the start we attempted to tax the users at the rate of seven cents per yard for every cubic yard that went through the apparatus. We also sold them the apparatus and charged them with the services of a competent foreman to run the same.

R. D. Q. 78. You say you attempted to tax the users. Am I to understand that this attempt was discontinued?

[fol. 17] A. It always ended in a compromise. We never refusing to take what was offered.

R. D. Q. 79. What was the minimum, so far as you recollect, accepted by the Concrete Appliances?

A. I cannot definitely answer this question. I believe, however, on one case, on the Washington Water Power dam job, at Spokane, our royalty amounted to something like $70,000 and we settled for something around $15,000. This rate was afterwards reduced to two cents a cubic yard.

By Mr. Anderson: All this line of examination is objected to as immaterial.

R. D. Q. 80. Were there any instances in your recollection when the company waived a claim to any royalty whatsoever?

By Mr. Anderson: Objection repeated.

A. In most all the early cases which were failures we made no charge.

R. D. Q. 81. Did you consent to testify today willingly or unwillingly?

A. Unwillingly.

R. D. Q. 82. Have you any interest financial or otherwise in the outcome of this controversy?

A. None whatever.

(Re-direct examination closed.)

Recross-examination (without waiving objections):

R. X Q. 83. In all cases while you were in the employ of the Concrete Appliances Company where the jobs were successful, that company did receive royalties, did it not?

A. I believe there were one or two cases where they did not receive royalties, but we always secured a written acknowledgment of the contract which was a recognition of the patents.

(Examination of witness closed.) Charles W. Ellis.

[fol. 18] NOTARIAL CERTIFICATE

STATE OF NEW YORK,
City and County of New York, ss:

I, C. E. Davidson, a notary public, in and for the County and State of New York, do hereby certify that pursuant to the annexed notice in the above-named cause, I was attended at the offices of Messrs. Gifford & Bull, No. 141 Broadway, New York City, by Cyrus N. Anderson, Esq., counsel for the plaintiffs, and by Thomas H. Sheridan, Esq., on behalf of the defendants, on the thirtieth day of November 1921, at 10 o'clock A. M.; that the aforenamed witness, Charles W. Ellis, who was of sound mind and lawful age, was by me duly sworn to testify the truth, the whole truth and nothing but the truth, and thereupon testified as is above set forth; that the deposition subscribed by the witness as above set forth was by me reduced to writing in the presence of said witness himself and from his statements, and was subscribed by said witness, and was taken at the place in the annexed notice specified, and was done in the presence or with the consent of said counsel for plaintiffs and defendants.

I further certify that I am neither of counsel nor attorney to either of the parties to said suit, nor interested in the event of said cause.

Witness my hand and seal this thirtieth day of November, 1921.

C. E. Davidson, Notary Public, No. 16, New York County.
My commission expires March 30, 1922. (Seal.)

[fol. 19] Philadelphia, Pa., Tuesday, October 4, 1921—10 a. m.

Present: Parties as before noted.

DEFENDANTS' EVIDENCE IN OPEN COURT

Mr. Jones: Defendants now offer in evidence the depositions heretofore taken and the exhibits identified in the printed record of said depositions

Defendants also offer in evidence as Exhibit No. 66 the bound folder of copies of the patents set up in the answer.

Mr. Hood: Plaintiffs renew the objections entered in the printed record referred to.

Counsel for plaintiffs note that Exhibit 64 as offered does not correspond to the said exhibit as presented to counsel for plaintiff for approval prior to the stipulation which has been entered of record with reference thereto on page 696 of defendants' printed record, and said stipulation is hereby withdrawn as to the following portions of Exhibit No. 64.

"Concrete and reinforced concrete construction by Homer A. Reed, 1907, page 108," and

"Michigan Engineer, 1905-1908, concrete mixing and delivery plant, by William G. Fargo," and

A photostatic reproduction of a page, 187, headed "Practical Construction," and bearing an illustration, "Fig. 260," purporting to be from a book by one Marsh.

These three portions of Exhibit 64 are objected to on the ground that they have not been properly proven.

[fol. 20] Counsel for plaintiffs state, however, that if prior to the filing of brief by the plaintiffs in this case, he can be reasonably satisfied as to the correctness of the portions objected to, and the dates which they purport to bear, he will agree that the objection just entered may be withdrawn.

JOHN R. WILLIAMS, having been duly sworn, was examined and testified as follows on behalf of the defendants:

By Mr. Jones:

Q. 1. Please state your name, age, residence and occupation.

A. John R. Williams, age 48. Manager of the Atlantic Division of the Great Lakes Dredge & Dock Company, with headquarters at New York City.

Q. 2. How long have you been connected with that company?

A. Since early in the year 1906.

Q. 3. Please outline the character of the work carried on by that company, and the scope and nature of its activities.

A. We operate all over the Great Lakes, and between there and the Atlantic Coast, and on the Atlantic Coast, even as far as Philadelphia and Boston, but the construction work is confined largely to the Great Lakes, although we are doing and have done considerable on the Hudson River.

Q. 4. State a little more in detail what kind of work your company does.

A. We do all kinds of construction work, harbor improvements, foundation work, tunnel work, dry docks, anything of a construction nature; bridge work.

[fol. 21] Q. 5. Can you give some idea of the financial magnitude of your annual operations?

A. Well, our gross operations would run anywhere from eight to twelve million dollars annually.

Q. 6. Does this work you have referred to involve the placing of concrete?

A. To a very large extent.

Q. 7. Are you familiar with any instance of the use of chutes for distributing concrete in your work?

A. Yes, I am. In about May, 1906, the United States Steel Corporation started the development of the Gary Steel Plant on Lake Michigan south of Chicago. This was to be about a one hundred million dollar improvement, and our people early in July acquired the contract for the entire harbor, together with the pumping station and intakes, as well as water tunnels and the like of that. They made a start on this harbor development and pumping station and intake in the latter part of June.

Q. 8. What year?

A. Nineteen hundred and six, or early in July. I think they acquired the contract around the first of July. However, I was down there in an assisting capacity in getting the equipment in the forepart of July. In the latter part of July, I think around the 24th, I was sent down there in charge as general superintendent of all work we had there, which amounted to around two and a half million dollars at that time, which was afterwards increased considerably. One of the first units to be put in, and of necessity crowed, was the pumping station and intake, because of the fact, as soon as the development of the plant had reached any magnitude, they would have to have the water for the plant service, and this pumping station was of considerable size, suitable for serving, I believe, twelve blast [fol. 22] furnaces, which was a large unit. We made a start on the pumping station early in July, 1906, by putting in a coffer-dam, and when I arrived on the field it was under way, but not completed—that is, the coffer-dam. This work was crowed, and along in November I should say, of the year 1906 we reached the point of concreting in this pumping station.

I might describe the pumping station a little. It was a coffer-dam about thirty feet in width, that is, the deep part, by 100 feet in length, and went down to 24 feet below mean low water. I am going into these details because I want to tie in the fact of the location of the mixer and the method used. I want to establish the fact that the mixer was located probably forty feet above our lowest point of deposit of concrete, and immediately alongside of the coffer-dam excavation. The walls of this sub-structure were of considerable dimensions as to width, and of necessity a full height of ultimately forty-odd feet, and the mixed being placed up alongside, it permitted us to use chutes for depositing same, but to use the chutes it also necessitated using quite wet concrete, and we had quite a strong and continued fight on the feature of using wet concrete, which permitted us to use the chutes, as the engineer in charge, or I should say, the general superintendent in charge, as many were at that time, was very much against wet concrete. The wet concrete helped us in other ways because of the numerous bracings in the coffer-dam, it was quite difficult and took quite a little time to change the set-up of our mixer, as the whole affair would have to be raised up and moved over into different bays between the bracing. The mixer was a Smith batch mixer on a small car that went on a standard gauge railroad track immediately alongside of the excavation on the trestle. [fol. 23] In front of this and beneath the outlet of the mixer was a triangular shaped trough or chute built of plank. So that when the mixer was emptied or rolled over to empty, it would deposit the concrete in this chute. At the end of this chute, which was drawn together, were suspended our metal chutes, which extended from that point down into the coffer-dam area. Sometimes there were one, two and three chutes, and the long ends of them were suspended, either resting on the bracing or suspended from the bracing. Sometimes timber was put under them to help hold them up. Then at the end of the straight portion of the chute, another chute would

be laid under that to take the concrete sidewise in directions other than straight away from the mixer.

That work on the pumping station proper was completed, I believe, soon after the first of the year 1907.

However, in March, 1907, we were starting the intake section, which was two concrete tunnels extending from the pumping station, approximately 700 feet toward the location of the slip we were to dig in from the lake. The bottom of these two tunnels was about 22 feet below datum, and the ground elevation along this point, the same as at the pumping station, was about 20 feet above datum, indicating the height at which our mixing plant would stand with reference to the tunnels. The same mixer rig was transferred around to the side of the tunnels, which went at right angles to the long axis of the coffer-dam, and for the first week or two, due to the difficulty we had in getting in the first section of the tunnels as it left the pumping station, practically the same rig was used as in the pumping station proper, that is, the mixer rig, but due to the necessity of standing the mixing rig back away from the excavation, due to the slope of the banks at the side, as our sheathing only [fol. 24] came up about four feet above datum, we had to reach farther with our chutes, and the suspension of the chutes, the method we used in the pumping station, was not satisfactory, and at that time, I should say in April, 1907, about, there was a boom attached to the mixing rig, which could support these chutes, 1, 2, or 3, whatever was required, depending upon the distance the concrete was to be deposited away from the mixer, and this boom was supported from the point to a short mast incorporated in the structure around the mixer, and it was pivoted at the bottom to permit raising or lowering or swinging either way, which would premit the concrete to be deposited out in front on an arc, whatever the particular requirements required at that time. We had practically the same wooden hopper immediately under the concrete mixer, which the mixer dumped in, and then at the outlet of that it was restricted, that is, it flared out over the side in front of the mixer, and was drawn down to possibly twelve inches at the outlet, or a little more, and immediately under that was suspended the upper end of the chutes. This end was usually suspended by means of a short A frame that was stepped. The suspension of the upper end of this chute was partially from this short A frame that stood in front of the mixer, and somewhat to one side of the center of the pump, and the lower part of the chutes, which would be never less than two sections of the chute, would be suspended from the point of the boom by means of a fall and tackle. The upper end of the upper chute section was somewhat flared out to assist in preventing the concrete when the chute was led off to an angle from over-running as it came out of the wooden hopper. When there were three or more lengths of metal chute used, the end of the third chute toward the mixer would also be suspended from the end of the boom by means of slinging it [fol. 25] from the lower end of the second chute section. In other words, it was a continuous chute, except it had an angle, and did not lead straight from the main chute.

Q. 9. Who was credited as the designer or proposer of this rig you have just described involving chutes and a boom?

A. I should say it was the outcome of our organization, although probably Mr. Cameron, who was then our concrete superintendent, had as much, if not more, than anyone else to do with it.

Q. 10. You referred to a general superintendent as being opposed to wet concrete. Was that your general superintendent?

A. No, that was Mr. Gleason, who was in charge of the construction of the Gary Steel Plant for the Steel Corporation. He was in entire charge of the whole development and is at the present time.

Q. 11. I call your attention to Defendants' Exhibit No. 17, "Great Lakes Dredge & Dock Company's Photographs," and will ask if you can identify any of the views shown therein, briefly.

Mr. Hood: Counsel for plaintiffs object to a reference to any of these photographs which bear date subsequent to the date of the particular application on which the patent in suit was issued, that date being January 21, 1909. It seems to me a reference to these subsequent devices is wholly immaterial.

(Testimony taken subject to the objection.)

By Mr. Jones:

Q. 12. Proceed.

A. "A" is a photograph showing the mixer I have just described used in connection with the building of intake sections, and this shows it at a point approximately half way down the intake section. It is not complete there, as it had been partially dismantled to be moved into this position.

[fol. 26] "B" shows a floating mixer plant that we constructed a little later, I think in 1908, for use in connection with the building of the turning basin concrete docks and the coke oven pumping station. This rig was substantially the same and was copied after the mixer rig that I have described previously.

"C" is a tower rig that I have seen on the Iroquois Iron Company's plant at South Chicago used by our people in the building of that plant.

"D" is another view of this same Iroquois plant showing a tower mixing rig for depositing concrete through chutes, which I saw there.

"E" is another view of the same plant showing a floating mixer rig used for concreting the ore dock along the slip at the Iroquois Iron Company's plant.

"F" is a rig I am not familiar with as having seen.

"G" is another rig that I am not familiar with.

"H" is a rig that I am not familiar with except by reputation.

"I" is another one of the same.

"J" is also another one.

"K" is the first rig we used in 1906, which I described at the beginning of my testimony in connection with the pumping station sub-structure.

"L" is the same rig when it was first moved, and before the boom

was installed and set up at the beginning of the intake sections. This is all that Gary plant construction.

"M" is the same rig as improved with the boom which I more particularly described in my previous answer.

Q. 13. Who was responsible for the development of these successive devices which followed the 1906-1907 apparatus?

A. You mean at the Gary plant?

Q. 14. Yes.

[fol. 27] A. Our organization, those in charge of our operations, I should say. It was purely a Great Lakes development.

Q. 15. You mean no one particular man?

A. I could not say that there was, no. It was the effort of all studying out the conditions that we had. Our general manager, Mr. Lutz, perhaps suggested as many things as any one else. It was a composite affair.

Q. 16. You have referred, I believe, to offices in other cities besides Chicago?

A. Yes, we have eight different divisions, and while I did not see all of the other plant of this nature in operation, I was in touch with every building and operation through the intercourse I would have with other members of our organization, as we were going back and forth, and then we also have a weekly publication by the manager of each division in which is noted the developments during the previous week, whatever of interest came up like constructing a new plant, the operation of a new plant, and in that way I have followed more or less the development of the different points, although I have not seen all of them, and there were no instances where this tower mixer, either on land or water, were started on a job but what they went through and were completed as outlined. Of course, they have been perfected and changed to suit different condtions.

Q. 17. You mean the concrete work went through and was completed?

A. Yes. We found mixer rigs that we have developed that practically started from those that we had at Gary.

Q. 18. Since June of 1907 for about how many years have you used a concrete distributing apparatus comprising chutes hung from a boom which could swing from side to side?

A. We are still using them.

[fol. 28] Q. 19. How continuously have you used them during that period of time?

A. Practically all of that time. Of course there would be intervals when one plant might be idle for a few months. Of course on the lakes, in the winter season, they are not used on account of the freeze-up.

Q. 20. Are you or is your company financially interested or otherwise interested in the outcome of this suit?

A. In no way whatever except in the general benefit to all contractors.

Cross-examination by Mr. Hood:

X Q. 21. Your company at the present time and for some years since 1910 has used plants like those shown in some of the photographs of Exhibit 17 in which the boom and hopper could be vertically adjusted on the tower and in which the boom carried a chute section which had its upper end pivoted to the hopper and its lower end suspended from the boom. That is correct, is it not?

A. Yes, sir.

X Q. 22. So that if this patent is valid, your company would be an infringer?

(Objected to.)

A. Well, I am not a lawyer. I don't know as to that.

FRED BRUNER, having been duly sworn, was examined and testified as follows:

By Mr. Jones:

Q. 1. Please state your name, age, residence and occupation.

A. Fred Bruner. Age, 41. Vice-president and general manager of the Pihl & Miller Company, Pittsburgh.

[fol. 29] Q. 2. Have you had any experience in placing concrete?

A. Considerable.

Q. 3. Since what date?

A. When I left school in the spring of 1910 I went to Chicago and was employed by the William B. Hough Company, sales representative of concrete machinery, and I had obtained considerable experience associating with contractors, and directing the placing of reenforcing steel in various buildings, and in the fall of 1910 we, that is, the company, took the agency of the Concrete Appliances Company of Los Angeles for a system of placing concrete, using booms and troughs, and so forth. At this time we did not know a great deal about this, but from sketches and so on, drew up plans, and had material manufactured, consisting of pans, swivels, pipes, and so forth. Then we proceeded to introduce this material on a sales proposition and a royalty for the use of the idea.

The first operation that I had any experience with was the W. J. Newman Company of Chicago, for placing the concrete in the caissons, I believe at the Insurance Exchange Building foundation. I supervised the erection of the tower, the construction of the boom and the general rigging up of the plant, but owing to the fact that we were not so sure about our knowledge of the operation of this apparatus, the Concrete Appliances Company sent on Mr. Theodore Emtman of Los Angeles to give this plant a final inspection. This was done by Mr. Emtman, and the plant was practically O. K'd, and they proceeded to attempt to operate it. The operation was never successful to the architects and engineers, nor to the contractor; owing to the difficulty with the pipes clogging, and a general inexperience with

the plant practically. At this time Mr. Emtman, however, said that he had operated similar plants in Los Angeles with absolutely no [fol. 30] trouble, and had practically developed the entire apparatus, and had anticipated getting some patents, but discovered that——

Mr. Hood: I object to statements that Mr. Emtman may have made in matters of that kind as wholly immaterial and hearsay. The defendants in this case had Mr. Emtman as their witness, and did not examine him on that subject at all.

Mr. Jones: We had Mr. Emtman examined as well as we could on everything, but he did not remember anything.

Mr. Hood: No questions were asked about an alleged conversation in Chicago with this witness or with anybody else.

(Testimony taken subject to the objection.)

By Mr. Jones:

Q. 4. Proceed, then.

A. (Continuing:) But discovered that some other people had secured patents ahead of him. Due to this condition it was necessary for him to get together with the other people who had obtained these patents, and the entire bunch were thrown together and assigned to one party. In my opinion, Emtman certainly understood how to handle these things, but for some reason could not make this one in Chicago work.

Mr. Hood: We move to strike out all of the hearsay evidence.

The Court: The testimony now objected to is admitted subject to the objection, which is to be ruled upon along with the other issues in the cause, with leave to the objecting party to move to strike out, which motion is to be considered as if made in support of every objection, and an exception is allowed to the party against whom the final ruling is made, this ruling to apply not only to the examination [fol. 31] of the present witness, but to all of the succeeding witnesses, and to all of the evidence at any time produced in the case, and is also to cover instances of all objections heretofore made.

By Mr. Jones:

Q. 5. What did you learn as to who was responsible for the development of the main features of this apparatus which you were attempting to license?

A. Theodore Emtman.

Mr. Hood: That is objected to as hearsay.

The Witness: Well, he said he was.

By Mr. Jones:

Q. 6. Was the concrete work on this Newman job completed with this apparatus?

A. No. These pipes clogged up, and gave so much trouble, that too many caissons were open, and no concrete placed in them, so that

Newman was practically forced by the architect to abandon this method and fill the caissons by the previous method of carts.

Q. 7. Were any licenses, or license fees, paid, or was any other payment made for this apparatus?

A. I do not know. That would be handled in the office.

Q. 8. What was the next job you were connected with?

A. The next job of any importance that I was on was Dry Dock No. 4 in the Brooklyn Navy Yard.

Q. 9. If an apparatus of this type was used there, please describe it, and the circumstances.

A. After the failure or the practical failure of the Newman job we decided that pipes were not the proper method of conveying concrete. So we designed the pans and swivel joints, and made them applicable to an open trough. This open trough system was the materail that was shipped to the Brooklyn Navy Yard.

[fol. 32] Q. 10. What was the approximate date of the Newman job and of the Navy Yard job?

A. The Newman job was in the fall of 1910, and I went to the Navy Yard in the latter part of April or May of 1911.

Q. 11. Did the apparatus work at the Navy Yard?

A. It worked better than at the Newman job, but still was not satisfactory, the principal reason being the sagging of the chutes, causing them to clog up, and the entire slowness of the process of placing concrete from this tower.

Q. 12. What can you say with reference to the cost of such placement?

A. Well, of course, the way these things were sold, they were sold on a royalty basis, of so much per yard.

Q. 13. How much?

A. Ten cents per yard. The person selling the apparatus had to be able to convince the contractor that he could place his concrete with a much smaller crew and, of course, effect a saving considerably over the ten cent royalty.

Q. 14. How did this work out?

A. On these two jobs it did not work at all. At the Brooklyn Navy Yard we placed about between five and six hundred yards of concrete through this apparatus at a cost of about $6000.

Q. 15. And then what happened?

A. It was taken down and moved.

Q. 16. How was the rest of the concrete placed?

A. Before we put this plant up the concrete was being mixed on the coffer-dam wall at the head of the dock, conveyed completely around the dock on tracks in the two-yard cars, then chuted from the cars to placement anywheres in the dock, and, of course, this concrete placing was going on all the time we were erecting and experimenting with the gravity system.

[fol. 33] Q. 17. Describe briefly the apparatus known as the gravity system?

A. It consisted of a hoist, a tower of suitable height, from which would be either suspended by cable or by a swinging boom, troughs, through which the concrete was to flow to place.

Q. 18. And is this what you have referred to as Emtman's alleged design?

A. Yes.

Q. 19. In the Navy Yard job did you complete your work with your apparatus or discontinue before completion?

A. No, we erected the job complete, according to the layout, prepared to place the concrete from the center of the dock to within about four hundred feet of the ocean end. From that point the gravity system would cover the entire dock lay-out.

Q. 20. Were you paid your royalty?

A. I have not any idea. I don't believe so, however.

Mr. Hood: I move to strike that out as an opinion of the witness.

By Mr. Jones:

Q. 21. Was that $6,000 figure intended to be high or low?

A. In the construction of the plant, the experimentation cost a whole lot more than any one had anticipated.

Q. 22. I just want the Court to understand whether you consider that the $6,000 was an extravagant figure, or a very reasonable figure.

A. No, that was extravagant.

Q. 23. What did you do after the Navy Yard job?

A. After the Navy Yard job I left the William B. Hough Company and went with Parrott Company, of San Francisco, who had taken the agency for the Concrete Appliances Company's material [fol. 34] on the Pacific Coast.

Q. 24. What did you do next?

A. Went to Spokane, Washington, to interview the Washington Water Power Company in reference to using this material on the installation of a hydro-electric department at Long Lake, Washington.

Q. 25. Do you mean this so-called Emtman apparatus?

A. Yes. The Washington Water Power Company were favorably impressed with their investigation, and signed up for a lump sum amount for the services of the erection, engineering and use of this apparatus.

Q. 26. How did the apparatus work on that job?

A. On that job it worked out better than on any other because we had had—that is, I personally had had enough experience by that time to know where the troubles were in the other plants, so that this one was erected safe, and after a few minor troubles, that you would experience in most any comprehensive system, it worked all right.

Q. 27. What year was this?

A. That was probably in the year—it started in 1912.

Q. 28. What did you do next?

A. That was the only real job we did on the Pacific Coast. After several attempts to sign up other jobs, which I was not able to do, because all the contractors stated the lay-out was nice, and it looked good, but they did not feel like paying anyone any royalty for using it. So, therefore, as a general rule, they went ahead and used the

apparatus, and our company would get nothing out of it. I wrote to the main office of the Parrott Company and also to the Concrete Appliances Company about these alleged infringements, but never could get any action, so I resigned and came back east.

[fol. 35] Q. 29. Do I understand that the Parrott Company was the western agent for the Concrete Appliances Company of Los Angles?

A. Yes.

Q. 30. After you came east, what can you say with reference to any possible further use of a similar apparatus by contractors or builders?

A. Practically everybody that had a job where they thought this apparatus would apply were using it. I came to Pittsburgh, and Booth & Flynn, contractors of Pittsburgh, were using an exact duplicate of this material on the approaches to the Manchester Bridge. T. A. Gillespie and Company were using it on dams sixteen and seventeen in the Ohio River. M. J. O'Hara and Company were using it on open cut tunnel. It was being used on several apartment jobs right in Pittsburgh, practically duplicate stuff.

Q. 31. Were royalties being paid?

A. No.

Q. 32. About when was this?

A. Nineteen hundred and thirteen.

Q. 33. Do you know how long the Parrott Company continued to represent the Concrete Appliances Company?

A. No.

Q. 34. Do you know whether they still represent them?

A. I do not.

Q. 35. Was there any publicity given to any of these Pittsburgh jobs you have referred to?

A. Yes, the Booth & Flynn job was very completely written up and photographed, that is, cuts were published in the Engineering News at that time.

Q. 36. When you were in San Francisco did you ever hear of Healy, Tibbitts and Company?

A. I knew them as extensive contractors along the water front [fol. 36] in San Francisco and in Oakland and around.

Q. 37. Did you ever see any of the apparatus they may have used for distributing concrete along the water front?

A. Not that I know of. I did not pay any attention to it if I did.

Q. 38. I call your attention to Exhibits Nos. 41 and 42, and will ask you to state briefly what, if anything, you know about them.

A. Which is this?

Q. 39. Exhibit No. 41.

A. Exhibit No. 41. This sketch marked 40 is a sheet similar to some that were furnished by the Concrete Appliances Company to the William B. Hough Company to detail the material from.

Q. 40. What is the third sheet marked "Gravity system, Wiliam B. Hough Company"?

A. That is a typical layout that we would make for installation for

a specific case. The circles show the radius of the booms, these smaller circles show the radius of the swinging trough at the end of the boom. The big circle shows the entire radius covered by one particular plant.

Q. 41. You mean that the concrete could be deposited at practically any point within the available space of these circles?

A. Anywhere within the available space of these circles.

Q. 42. Was this considered an important feature?

A. Yes, because with the same apparatus, if the concrete could be placed almost instantly from one point to another, that is, the placing of it transferred from one point to another, the whole job could be covered with no moving of the plant.

Exhibit No. 42 is the detail of practically the first apparatus we [fol. 37] had manufactured at Chicago. These drawings, that is, this first one, and most of these drawings, refer to materials that are used in connection with the pipe.

Q. 43. Whose design are they?

A. William B. Hough Company. That is, after the failure of the Newman job, we all held a conference, and made sketches, and changed the apparatus; so that the whole engineering department was responsible for the various changes.

Q. 44. Do you know anything about the apparatus illustrated in Exhibit No. 43?

A. I do not recognize this particular location, but that is the apparatus we were supposed to erect, with the wooden lattice boom, practically horizontal, with the topping lift lines on that boom, and the trough was attached, and the concrete flowed down this trough with a swivel at the end of the boom, and a receiving pan at the junction of the topping lift lines to the tower. This horizontal boom—the principal fault was, when the weight of the concrete caught in the center of the trough, coming from the hopper down to the end of the boom, the end of the boom would raise up, and destroy the slope of the chute toward the end and cause the clogging. So that these woden horses, two of which are shown on Exhibit No. 43, were afterwards installed to prevent this sagging.

Q. 45. Do you refer to the nearly vertical members in the upper picture extending from the lattice boom up to the pipe?

A. Yes.

Q. 46. Did all this apparatus which you have tried to license have the second swivel extension pipe at the outer end?

A. Yes.

[fol. 38] Q. 47. Of the boom?

A. Yes, sir.

Q. 48. That was essential, was it?

A. Yes, sir, in order to get from the end of the boom down to the work.

Cross-examination By Mr. Hood:

X Q. 49. Do you know of your own personal knowledge that no royalties were paid by any of the parties in Pittsburgh whom you say used the apparatus?

A. They all told me they were not paying them and that they have not paid.

X Q. 50. You do not know of your own personal knowledge that they did not?

A. Only what they told me.

Mr. Hood: Counsel for plaintiffs move to strick out the evidence on this point.

The Court: Does he know they used it?

Mr. Hood: Yes, he knows they used it, but he does not know whether they paid for it or not.

By Mr. Hood:

X Q. 51. When did you go to San Francisco?

A. I went to Spokane in the fall of 1911.

X Q. 52. You went from San Francisco to Spokane, did you?

A. No, I went from New York to Spokane.

X Q. 53. When was that?

A. I was in San Francisco then early in 1912.

X Q. 54. And you say you saw some operations on the water front of Healy, Tibbitts & Company?

A. No. I did not see them.

X Q. 55. You did not?

A. No, sir. I said I knew Healy, Tibbitts & Company.

[fol. 39] X Q. 56. What radical changes do you find indicated in Exhibit No. 42 over the structure illustrated in Exhibit No. 41? What radical changes in structure, or general theory of operation, do you find illustrated in Exhibit No. 42 over the instructions which you find in Exhibit No. 41?

A. They are entirely different exhibits, that is, No. 42 is a detail drawing of material used, and No. 41 is a general layout.

X Q. 57. So that Exhibit No. 41 was not intended to be detailed instructions for the construction of the apparatus, was it?

A. Well, it is the detail drawings of the stuff incorporated in the apparatus.

X Q. 58. That is, Exhibit No. 41 contains detailed drawings does it?

A. Yes, sir.

X Q. 59. And Exhibit No. 42 contains detailed drawings also, does it not? This Exhibit No. 42 (indicating).

A. You have got me mixed up. I have got that all mixed up. I thought this was Exhibit No. 41 and that was Exhibit No. 42.

X Q. 60. Now, you have Exhibit No. 41 in your hand.

A. Yes.

X Q. 61. Does that exhibit give any instructions or the detail of construction, of any parts of a concrete chuting apparatus?

A. Yes, these drawings, No. 9 and No. 10, are a detail of the connection between the 7-inch pipes used in the early apparatus, and the sheet with the number and title torn off is a general layout of a complete installation.

X Q. 62. The revised sheet No. 5 of Exhibit No. 42 is substantially identical in the instructions which it gives with the instructions which [fol. 40] you find on these sheets, No. 9 and No. 10 of Exhibit No. 41?

A. Exactly.

X Q. 63. Tell us what radical changes in structure are indicated in Exhibit No. 42 which you have in your hand over the structural details which are illustrated in Exhibit No. 41. There are not any radical changes, are there?

A. Well, now, sheet No. 3 on this Exhibit No. 42 shows the open trough which we used in place of the pipe. I would say that is the only sheet that, to my knowledge, would be any different than what is on Exhibit No. 41.

X Q. 64. While you were with the Hough Company, they did make arrangements with some contractors to use the apparatus which they were licensing to use, and that apparatus was erected and successfully used in building operations. Is not that true?

A. Well, it was used for the completion of the building, but whether the clients were well satisfied I doubt considerably.

Mr. Hood: Counsel for plaintiffs move to strike out all of the preceding answer following, "But whether," as pure surmise, and not responsive.

Redirect examination by Mr. Jones:

R. D. Q. 65. How detailed were the drawings originally furnished you by the Concrete Appliances Company as a basis for your interesting customers?

A. They did not furnish any drawings for specific customers. We made those ourselves. The thing that they furnished was some similar detail to that shown on Exhibit No. 42. Then when Mr. Emtman came to Chicago he, in conjunction with the Hough organi- [fol. 41] zation, completely developed those shown on Exhibit No. 42.

Mr. Jones: I offer in evidence as Exhibit No. 67 a copy of the Smith patent, No. 948,746.

Also Exhibit No. 68, being a certified copy of a skeleton history of the Emtman patent, No. 948,723.

(Defendants close.)

Plaintiffs' Rebuttal in Open Court

Frank I. Ginsberg, having been duly sworn, was examined and testified:

By Mr. Hood:

Q. 1. Please state your name, age, residence and occupation.

A. Frank I. Ginsberg. Age, 36. Residence, 1055 Grand Concourse, New York City. Occupation, plant engineer.

Q. 2. In what were you engaged, and where were you engaged, in the latter half of the year 1906?

A. I was in San Francisco engaged in placing the re-enforcing steel on concrete buildings.

Q. 3. In whose employ were you at that time?

A. Part of the time for Healy, Tibbitts & Company of San Francisco.

Q. 4. How long did you remain in the employ of Healy, Tibbitts & Company?

A. I would say approximately a year.

Q. 5. Beginning when?

A. I would say the latter part of 1906; 1907, possibly.

Q. 6. You had charge of the placing of the reenforcing steel for concrete structures under fabrication by that company during that period, did you?

[fol. 42] A. I did.

Q. 7. Was it part of your duty to visit all of the work of the Healy, Tibbitts & Company going on in San Francisco during that period?

A. No, only on certain jobs where I was employed.

Q. 8. Did you visit the other jobs from time to time during that period, however?

A. I did.

Q. 9. Do you know, or did you know at that time, a man by the name of Charles C. Horton?

A. I did.

Q. 10. Was he the vice-president of Healy, Tibbitts & Company at that time?

A. I don't know.

Q. 11. Did you know a man by the name of Martin E. Brown at that time?

A. I did.

Q. 12. What was his employment at that time?

A. He seemed to have charge of the delivery of material, building supplies, to the various building operations.

Q. 13. Mr. Horton and Mr. Brown have testified on behalf of the defendants in this case that in the spring of 1906 in the fabrication of Piers 42 and 44 on the San Francisco water front there was used an apparatus which is illustrated in this memory sketch, Exhibit No. 61. Those gentlemen have also testified that that same apparatus was used by Healy, Tibbitts & Company in the subsequent fabrication of their reenforced concrete structures for a period of a year or more following the middle of 1906. While you were in the employ of Healy, Tibbitts & Company did you see any such apparatus in use on any of the Healy, Tibbitts & Company jobs?

A. I did not.

[fol. 43] Q. 14. If you had seen such an apparatus would you have remembered it?

A. Undoubtedly.

Q. 15. Were your duties with Healy, Tibbitts & Company of such a character as to bring you in close and intimate association with the appartus which was used for the placing of concrete?

A. Yes.

Q. 16. What was the apparatus commonly and generally used by Healy, Tibbitts & Company in placing concrete during the period of your employment with Healy, Tibbitts & Company?

A. A concrete mixer, a hoisting engine, wooden tower, a bucket or a skip, a floor hopper, from which point the concrete was distributed over the entire floors by means of runways supported on horses or small trestles.

Q. 17. Did Healy, Tibbitts & Company during your period of employment by them make use of any concrete distributing apparatus which involved a swinging boom carried by a hoisting tower and shifted up as the work progressed, and operating as a support for a chute which was connected with the hopper?

A. I cannot recall an instance.

Q. 18. If there had been an instance, would you have recalled it, do you think?

A. Yes, easily.

Q. 19. I call your attention again to Exhibit No. 61. What have you to say as to the probability of the operability of the alleged chute, which is illustrated in that drawing.

Mr. Jones: That is objected to as calling for an opinion on a hypothetical matter, and also as immaterial.

(Testimony taken subject to the objection.)

[fol. 44] A. It is my opinion that the arrangement of chutes that are shown on this plan could not be made to operate practically, due to the fact that unless this chute would have some means of support at either individual section it would sag down and create a trap, much the same as a plumber's trap, and thereby entirely block the flow of concrete through that chute.

Q. 20. That is to say, you understand this drawing to illustrate an inclined pipe, composed of a series of sections, which are connected together by chains and hooks. Is that right?

A. That is right.

Q. 21. Is that what is ordinarily termed a Tremie pipe?

A. Yes.

Q. 22. The connection between the two sections of a Tremie pipe is such as would afford flexibility?

A. That is right.

Q. 23. And I understand you to say that if a Tremie pipe like that shown in Exhibit No. 1 be set at an angle as shown in that exhibit, it would operate as a series of successive traps for the concrete at each junction between each pair of sections, unless some means we provided to tie up each joint, and in that way hold the structure straight?

A. That is correct.

Q. 24. Would it be practically possible to tie up the joints of a Tremie pipe in that way?

A. It may be, but I have never seen it done.

Q. 25. Under what conditions of position is a Tremie pipe useful or operable in the handling of mush concrete?

A. Only where the concrete is deposited vertically through this Tremie chute, or it is used in many cases where the concrete is deposited under water, and it is desired to present the separation of materials which would take place if it was merely dropped into a form, [fol. 45] instead of being lowered through a Tremie chute.

Q. 26. Have you examined this piece of rusty pipe, Exhibit No. 62?

A. Yes.

Q. 27. What is that piece of pipe, or what was it originally?

Mr. Jones: That is objected to, as the witness has testified that he has not seen the alleged apparatus of Healy, Tibbitts & Company.

(Question withdrawn.)

By Mr. Hood:

Q. 28. What does that piece of pipe look like? (Exhibit No. 62.)

A. My opinion is that that would be the top or funnel section of a piece of Tremie chute. I judge that by the hooks that are on it, and my opinion is that there were two more such hooks on that front section, which has been rusted through.

Q. 29. What condition on this exhibit do you find which would indicate that these hooks that exist on the apparatus had lower hooked ends, which had been broken off?

A. There would have to be something to support the next section of that chute.

Q. 30. Is there anything that you can find about this Exhibit No. 62 which would indicate that it had formed a part of an inclined chute supported by a boom in the manner illustrated in the sketch, No. 61?

A. No, nothing.

Q. 31. Is there anything about this Exhibit No. 62 which would indicate to you that that had not been used as such a chute?

A. There is.

Q. 32. What is that?

[fol. 46] A. Hooks on the side, which would be very unusual in the case of an inclined chute.

Q. 33. In Mr. Brown's testimony I find that he stated in cross-examination that in 1906 or 1907 buildings were built by Healy, Tibbitts & Company, one being called the Guntz Building and the other the Tillman and Bendel Building. Do you know anything about either of those buildings?

A. I do.

Q. 34. Were they built after you arrived in San Francisco?

A. They were.

Q. 35. Did you have any duties connected with the building of those buildings?

A. I placed the re-enforcing steel on the Tillman and Bendel Building.

Q. 36. What sort of apparatus was used to distribute the concrete on that building?

A. A concrete mixer, a wooden tower, hoisting engine, bucket, floor hopper, concrete carts on runways supported by horses on the floor; the old-fashioned method.

Q. 37. Were those runways placed after you had placed your reenforcing steel?

A. They were.

Q. 38. Do you have a distinct recollection of them?

A. Yes, I have.

Q. 39. Was there any boom supported chute used to chute the concrete on that job?

A. No.

Q. 40. What have you to say about the Guntz Building?

A. The Guntz Building is a steel frame structure with fireproof [fol. 47] floors where it would have been absolutely an impossibility to use a boom supported plant of any type.

Q. 41. How was the fireproof placed on that building?

A. It is hoisted up to various floors, and distributed by means of wheelbarrows and concrete carts. It is today.

Q. 42. You know that of your own personal knowledge on the Guntz Building, do you?

A. I do.

Cross-examination by Mr. Jones:

X Q. 43. Will you state again when you went to Healy, Tibbitts & Company?

A. I will say some time in the latter part of 1906 or 1907.

X Q. 44. Do you recall when the earthquake and fire occurred?

A. I do. I was not there then.

X Q. 45. Are you at the present time interested in the Concrete Appliances Company or in the Insley Company in any manner, directly or indirectly?

A. I am.

X Q. 46. What is your connection?

A. I am with the R. E. Brooks Company, of New York City.

X Q. 47. What is their relation to these other two companies?

A. We sell Insley equipment in New York City.

X Q. 48. Did Healy, Tibbitts & Company use any booms at all in connection with their construction work while you were with them?

A. Booms?

X Q. 49. Yes.

A. They did. You mean—I beg your pardon?

[fol. 48] X Q. 50. Did they use any booms in conection with apparatus for distributing concrete?

A. I do not recall it.

X Q. 51. With reference to this drawing, No. 61, it would not be a very difficult problem, would it, for a contractor to tie these various sections together so that they nested closely, and made a fairly stiff pipe for a short distance?

A. I do not know how you would support them.

X Q. 52. Have you ever seen grain spouts consisting of a series of tapering sections fitted into each other?

A. I cannot say I paid any attention to them.

X Q. 53. About how long have tremie been used for depositing concrete, to your knowledge?

A. I have not any idea.

X Q. 54. As early as 1906?

A. I would not be able to state.

X Q. 55. But they have been used for a long time, have they not?

A. Probably before my time. I have no knowledge.

X Q. 56. Do you happen to know whether tremie are supported from a boom on these floating structures on which they are usually used?

A. Vertically, yes. Horizontally, no.

X Q. 57. Any way.

A. Vertically, yes. Horizontaly, no.

X Q. 58. For the purpose of swinging them around to vary the point of deposit under the water?

A. I have seen them used recently, vertically.

X Q. 59. With reference to these several buildings you have referred to, including the Guntz Building, you did not visit these buildings every day, did you?

A. No, only when they were pouring the concrete.

X Q. 60. That would be at intervals of how long?

[fol. 49] A. Oh, it would be three or four days, maybe a week.

X Q. 61. I think you said you had something to do with arranging the re-enforcing bars?

A. I did.

X Q. 62. So that your work would be in advance of the concrete work?

A. Not altogether. Much of our steel was placed while the concrete was being poured on the same floor and in other portions of the building.

Redirect examination by Mr. Hood:

R. D. Q. 63. In your cross-examination, when you were asked when you went to San Francisco, your answer, as I understood it, was in the later part of 1906 or 1907?

A. No, no; 1906. I arrived there August 27, 1906, to be precise.

Recross-examination by Mr. Jones:

R. X Q. 64. How do you fix that date?

A. Well, I just remember the date I arrived there. I cannot tell you how I fixed it. I remember arriving at San Francisco on August 27, 1906.

FREDERICK E. ENGSTRUM, having been duly sworn, was examined and testified as follows:

By Mr. Hood:

Q. 1. Please state your name, age, residence and occupation.

A. Frederick E. Engstrum. Age, 47. Residence, Wilmington, [fol. 50] North Carolina. Occupation, president, Newport Shipbuilding Corporation.

Q. 2. How large a corporation is that?

A. Just completing seven million dollars of concrete ships.

Q. 3. What relation do you have with the complainants, the Concrete Appliances Company?

A. I was vice-president from the time of its incorporation until father died over a year ago. Then I have been president since.

Q. 4. Were you in Los Angeles at the time of the building of the Majestic Theatre?

A. Yes, sir.

Q. 5. And were you interested in the Concrete Appliances Company at that time?

A. The Concrete Appliances Company had not been incorporated at that time.

Q. 6. Were you interested in the company which was fabricating that building?

A. Yes, vice-president and secretary and treasurer.

Q. 7. And did you keep generally informed of its building operations and the apparatus that was used on them?

A. I was actively in charge of all the construction.

Q. 8. You are an engineer by education, are you?

A. By education and practical application.

Q. 9. When the fabrication of the Majestic Theatre Building had proceeded part way, what sort of apparatus was used in handling the concrete and depositing it at various points?

A. What we call the gravity system, tower and boom, and pipes, troughs.

Q. 10. Please describe that apparatus?

A. The apparatus is nearly similar to this model here with the exception that it was all built of wood, with iron connections, and [fol. 51] the boom was used in a slightly different manner, but the pipe was used suspended under the boom.

Q. 11. What was the purpose of the boom?

A. First it was to swing and obtain lateral delivery of the concrete of the spout end, and the first tower was built some fifteen feet from the building and on the south side of the center of the building.

Q. 12. What was used, if anything, to hoist the concrete?

A. A bucket and electric hoist.

Q. 13. Into what did the bucket discharge?

A. A hopper.

Q. 14. What was done with that hopper from time to time?

A. It was elevated from time to time.

Q. 15. What was done with the boom when the hopper was raised?

A. It was elevated accordingly.

Q. 16. And by what means, in what way was the chute supported, the first section of the chute?

A. The first section of the chute was supported at the intake below the hopper with a—I don't know what material—either a wire or a cable, and by cables or wire under the boom.

Q. 17. Did that apparatus operate satisfactorily?

A. It did.

Q. 18. Was it used in the complete fabrication of the building after its installation?

A. It was.

Q. 19. About how far up had the building progressed at the time that apparatus was installed?

A. Up to the time necessary to pour the first cantaliver balconies.

Q. 20. Do you recall approximately the calendar time, that is, the month and year, when the apparatus was installed?

[fol. 52] A. It was very early in 1908.

Q. 21. Who was the designer and originator of that apparatus?

A. Mr. Lee Callahan.

Q. 22. He was at work on the Majestic job, was he?

A. Yes, sir.

Q. 23. In connection with the placing of the concrete?

A. Yes.

Q. 24. What, if any, dealings did you or the Concrete Appliances Company have with the Healy-Tibbitts Company of San Francisco?

A. Our agents prepared designs for the Healy-Tibbitts Company of a barge to be used on the water front, consisting of a tower and boom and what we call our regular apparatus, in about 1912 or 1913.

Q. 25. That was subsequent to the building of the Majestic Building?

A. Yes.

Q. 26. You prepared designs of that kind for the company, did you?

A. Our agent engineers did.

Q. 27. In those designs what was the construction as to the manner of support of the first chute section?

A. The boom section on a tower.

Q. 28. What was to be the condition of the boom in its connection with the tower?

A. It was to be adjustable and swing.

Q. 29. By "adjustable" do you mean movable upwardly on the tower?

A. Yes, sir. Vertically.

Q. 30. What sort of a hopper was to be used?

A. The hopper was to be the regular type, similar in design to the hopper here, vertically adjustable.

Q. 31. After those designs were made did the Healy-Tibbitts [fol. 53] Company pay the Concrete Appliances Company royalties?

A. They paid the Parrott Company, which was our agent, and the Parrott Company paid us.

Q. 32. You say that was about 1912?

A. To the best of my recollection, it was about 1912.

Q. 33. Attention has been called to the fact in this record by the defendants of Concrete Appliances Company of Missouri bringing a certain suit against a man by the name of Gerhart for infringement, and that that suit stood for sometime without action, and was then dismissed for one of prosecution. What have you to say about the dismissal of that suit and the reason for its non-prosecution?

A. Our company's office was in Los Angeles, and upon investigation of the conditions at St. Louis we found that the school building which Gerhart was building was a public school building, and our company was a young company, and the expense of prosecution in St. Louis was considerable, and it being a public building we were not sure whether we could recover. It was at a distant point. So the matter was dropped at that time.

Q. 34. After you had filed your suit did you have any information which led you to believe that Gerhart was not again infringing, but had simply used the apparatus on that one school?

A. We never heard of any more infringement from that source.

Q. 35. And you were under the impression that there was no further infringement?

A. Yes.

Q. 36. I call your attention to Exhibit 61, which is a memory sketch said to illustrate a certain apparatus used by the Healy-Tibbitts Company in the fabrication of water front piers 42 and 44 [fol. 54] prior to the fire and earthquake in San Francisco in April, 1906. What have you to say as to the probability or feasibility of an inclined chute made up of tremie pipe sections, as illustrated in that sketch, being capable of use in such a position in the chuting of concrete?

A. I would say that it would be a very unstable conduit, and in my opinion it could not be poured through it.

Q. 37. Why not?

A. On account of the ups and downs and traps and the unstable condition of the conduit. I would like to also state that that is on an angle, different of course than vertical.

Q. 38. You mean that if such a tremie pipe were suspended practically vertical it is entirely practical as a conduit for concrete?

A. Yes.

Q. 39. But that when swung off at an angle, as shown in that sketch, and suspended only at its two ends, it would not be practical?

A. No.

Q. 40. You had knowledge of the negotiations between your agents, Parrott & Company, and Healy-Tibbitts Company, which led up to the grant of a license to the Healy-Tibbitts Company, did you?

A. Yes, sir.

Mr. Jones. Your Honor, in that connection, we have been very liberal with refraining from objecting to these leading questions, but as this is a prior use at a date that is important, I am going to ask Mr. Hood if he will try and be a little less leading.

The Court: Your questions have been rather leading, Mr. Hood. As a matter of fact, these questions of fact as to which the witness is testifying are in real controversy, and the impression you get [fol. 55] from answers to these questions do not help that side.

Mr. Hood: I might say that I recognized our time was pretty short, and I was merely trying to get the thing closed up.

The Court: I encourage direct questions as distinguished from leading questions. I think there is an important distinction between the two. I like counsel to be direct, and I do not stand on the formality of leading questions, but when you come to the real thing in controversy your record ought to show that the fact emanates from the witness and not from counsel, or you do not get the full benefit of the testimony.

Mr. Jones: I enter a formal objection to the foregoing questions as leading.

Mr. Hood: Do you mean by that, that you are now objecting to all of the questions which were asked?

Mr. Jones: Practically.

Mr. Hood: If that objection is made, of course, I have got to start in and do this all over again with the witness.

The Court: That would not help you any. If the idea is conveyed to the witness, you do not help the situation any by starting all over again. There is nothing objectionable in the last question.

Mr. Jones: I was not objecting so much to that specific question as to the whole series.

The Court: That kind of a question is all right. That is what I call a direct question. It is merely introductory, anyhow. When you come to the vitals of the testimony, let the facts emanate from the witness and not be found in the form of the question.

[fol. 56] By Mr. Hood:

Q. 41. Was any statement made to you by the Healy-Tibbitts Company alleging use of apparatus like that shown in Exhibit No. 61 at a time prior to the time of your negotiations?

A. No.

Q. 42. There has been some testimony in this case relative to the operations of the Hough Company, in Chicago. Did that company report to the Concrete Appliances Company as to the placing of licenses for the use of your apparatus?

A. Yes.

Q. 43. Did they in that way, under your contract with them, become responsible to you for an accounting?

A. Yes.

Q. 44. As a matter of fact, did they make such an accounting and payment?

A. No.

Q. 45. Why not?

A. We endeavored to get an accounting from them, but it was always postponed, and finally we cancelled our contract with them.

Cross-examination by Mr. Jones:

X Q. 46. Will you kindly glance at Defendants' Exhibit 44, labeled "Photographs of Majestic Theatre," and state whether you recognize any of the apparatus?

A. Yes.

X Q. 447. You mean you recognize these pictures as the Majestic Theatre Building under construction?

A. Yes, sir, and part of the apparatus.

X Q. 48. Will you kindly point out to the Court any boom shown in any of these four photographs?

[fol. 57] A. This was just started. The boom was on the outside of the building. This is the very first of the pouring down on the cantalivers of the balcony. This pipe here is the conduit.

X Q. 49. The conduit there is resting on false work or trestles, isn't it?

A. Yes. That is before it got up to the main point of the pouring.

X Q. 50. Does this first photograph represent the balcony tiers?

A. Yes.

X Q. 51. Was this boom you refer to sort of a prop that helped prop up the pipe?

A. No. It was a boom latticed with wood, similar to this boom. (Witness refers to the model before him.)

X Q. 52. That boom, then, would have been in such a location that it could have been readily seen from the street at some stage of the construction?

A. On the south side of the building.

X Q. 53. Is that the main street?

A. The south side of the building. The building faces east on Broadway.

X Q. 54. Do you recall whether the Wright-Collander Building was built before the Majestic Theatre Building?

A. No. After.

X Q. 55. Were the operations overlapping to any extent?

A. The Wright & Collander Building?

X Q. 56. Yes. There were two buildings.

A. Which Wright & Collander building do you mean?

X Q. 57. Is there more than one in Los Angeles?

A. There is a big office building on the corner of Fourth and Hill.

[fol. 58] X Q. 58. Some reference has been made by a prior witness to a Wright-Collander Building built about the same time as the Majestic Theatre Building. Do you know which building that would be?

A. The building commonly called the Wright & Collander Building is at Fourth and Hill.

X Q. 59. Do you think that was built later than the Majestic Theatre?

A. Yes.

(At 12.30 o'clock p. m. a recess was taken until 1.30 o'clock p. m.)

1.30 p. m.

Present: Parties as before noted.

FREDERICK E. ENGSTRUM, heretofore sworn, recalled.

Cross-examination (resumed) by Mr. Jones:

X Q. 60. Mr. Theodore Emtman owned ten per cent of the stock of the Concrete Appliances Company, did he not?

A. For a time, yes. I do not remember just what percentage.

X Q. 61. Did not he own ten per cent last December, or January, as late as that period?

A. Not as I know of.

X Q. 62. Was Lee Callahan a stockholder in that company?

A. I don't remember.

X Q. 63. What was the nature of Lee Callan's job on the Majestic Theatre Building, if you recall?

A. He was one of my foremen.

X Q. 64. What was Mr. Theodore Emtman's position on the work?

[fol. 59] A. He was foreman or general foreman for different jobs.

X Q. 65. That is, he had charge not only of this, but other jobs; whereas Callahan was simply on this job until he went to San Diego?

A. Yes.

X Q. 66. Some of the witnesses have said that Callahan was a straw boss. Would that *be* a correct description?

A. Well, he was a sub-foreman, a minor foreman, or foreman of a particular kind of work.

X Q. 67. Is Mr. H. W. Bryson a son-in-law of your father?

A. Yes, he is my brother-in-law.

X Q. 68. He is your brother-in-law?

A. Yes.

X Q. 69. Mr. Hugh W. Bryson and Mr. Theodore Emtman are interested together, are they not, in a concession of considerable magnitude relating to fishing rights and other rights, near some islands adjoining Lower California?

A. I don't know.

X Q. 70. Was Mr. Theodore Emtman ever an officer of the Concrete Appliances Company?

A. No.

X Q. 71. Were you an officer of the Concrete Appliances Company?

A. Yes, I have always been.

X Q. 72. And your father was?

A. Yes.

X Q. 73. What is your present office in that company?
A. I am president.
X Q. 74. Mr. Emtman and Mr. Bryson have been associated in various business enterprises, have they not, outside of the Concrete Appliances Company?
A. I understand they have.
[fol. 60] X Q. 75. Do you recall that Mr. L. A. Parker was an engineer-architect employed in connection with the Majestic Theater Building?
A. Yes, sir.
X Q. 76. And did you know of the following in connection with that work: Kurt O. Wetzel and Swan Johnson?
A. Yes.
X Q. 77. Referring to Exhibit No. 61, Healy, Tibbitts & Company's drawing that Mr. Hood showed you, in which the pipes were made up of a number of sections, is it not a fact that if the angle of inclination were made fairly steep that the concrete would flow through those sections, without necessarily making them vertical?
A. It depends on how steep they were.

W. H. Insley, heretofore sworn, recalled.

By Mr. Hood:

Q. 1. Mr. Ingsley, who manufactured the apparatus which is complained of in this present bill of complaint?
A. The Archer Iron Works.
Q. 2. Where are they located?
A. In Chicago.
Q. 3. They do not appear as a party to this cause, do they?
A. Not to my knowledge.
Q. 4. What, if any, negotiations were carried on between you and the Archer Iron Works subsequent to the filing of the bill of complaint in this case?

Mr. Jones: We object to this line of testimony as immaterial and improper.

(Testimony taken subject to the objection.)

A. Immediately at the time when I obtained the exclusive license [fol. 61] under this patent, the president of the Archer Iron Works visited me at Indianapolis, and endeavored to get a license under this exclusive license so that he or that concern could manufacture this equipment, and at frequent intervals prior to the bringing of this suit I have had some conversation with him on that subject.

By Mr. Hood:

Q. 5. What was your answer to the request for a license?
A. My answer was that I did not consider it expedient to grant him a license.

Q. 6. Did you have a conference with the president of the Archer Iron Works subsequent to the filing of the bill of complaint in this case?

A. I had.

Q. 7. What, if anything, was said by him relative to any defenses to be made in this present suit and if so, by whom was that defense to be made?

A. I got the impression that the Archer Iron Works was defending this suit. Their president appeared at Indianapolis with their attorney with relation to this matter.

Q. 8. Do you recall anything that was said upon which you base your impression that the Archer Iron Works was defending this suit?

A. I do not recall the conversation excepting that he sat in at the time of our consideration of the matter relating to it.

Q. 9. Was there anybody there at that conference from the organization of the Gomery Company?

A. There was no one there.

Q. 10. Or the Concrete Construction Company?

A. There was no one there representing the defendants except the president of the Archer Iron Works and Mr. Jones.

Mr. Jones: I renew my objection to this entire line of examina-
[fol. 62] tion, also the motion to strike out.

The Court: I will adhere to the practice I said I would follow. As far as I am at present advised, I think both objections are well founded.

By Mr. Hood:

Q. 11. Have you had any search made of the files of engineering publications to locate, if possible, any description of the building of piers 42 and 44 on the San Francisco water front?

A. I had a search made by the Director of the Engineering Libraries of the National Engineering Societies for any publication or notice in any engineering literature of the construction work.

Q. 12. And what was the report of that librarian?

A. The only thing that could be found was a report of the Harbor Commissioners with reference to the expense, with reference to payments made relating to that work.

Q. 13. Please state whether or not the librarian to whom you have referred made any report to you of finding any publication which gave any description of any special apparatus used in the fabrication of piers 42 and 44 on the San Francisco water front?

(Objected to as secondary evidence and as hearsay.)

A. Nothing that could be found.

By Mr. Hood:

Q. 14. I show you Defendants' Exhibit No. 61, which is a sketch made recently, and alleged to be an illustration of the apparatus

which was used in the fabrication of the piers 42 and 44 on the San Francisco water front by Healy, Tibbitts & Company, and I call your especial attention to the upwardly and downwardly inclined series of pipe sections, and ask you to state whether or not from your [fol. 63] experience as a builder of concrete handling machinery such an apparatus could be used in the condition shown in that sketch to successfully handle concrete?

A. It could not. It would not carry the concrete.

Q. 15. Why not?

A. Because the sketch shows a chute designed and built for vertical use held in an inclined position, and it would sag, and the concrete would not flow through it in that position.

Q. 16. Will you please examine Defendants' Exhibit No. 62 and state what it is and what its characteristics are?

A. It is similar in all points of construction, in its cone shape and in the hooks at the top, to vertical tremie sections, of which I have manufactured and sold a good many hundreds.

Q. 17. Is the construction of the exhibit of such a character that the series so connected in the manner shown in Defendants' Exhibit No. 61 could be successfully used as an inclined chute?

A. They could not be sucessfully used excepting at a very slight inclination from the vertical.

Cross-examination by Mr. Jones:

X Q. 18. With reference to the licensees to which I believe you have referred, were the Lakewood and Ransome Companies quite substantial companies at the time you gave them licenses?

A. They were considered so.

X Q. 19. They were then engaged in substantially the same line of business that you were, that is, the manufacture of contractors' equipment?

A. They were.

X Q. 20. And those two controlled quite a large proposition of the business of the country, did they not?

[fol. 64] A. They were large manufacturers in the field.

X Q. 21. At this alleged conference in Indianapolis, at which I believe you state I was present.

A. Yes, sir.

X Q. 22. Didn't you or Mr. Hood make a statement to the effect that you did consider apparatus to be an infringement which consisted of chutes hung from an inclined cable, the so-called line suspension type, and that the only thing you did not charge as an infringement were the chutes supported on horses?

A. I did not have such a conversation, Mr. Jones, unless it was debated among ourselves at the time as to what was a boom or the eqivalent of a boom. There was a stage when we might not have been able to have answered that question exactly.

Mr. Hood: I offer in evidence the depositions of Edward Anderson, Hooper Anderson, William T. Parker, Lee Callahan, Charles

Cooper, Rowland Brinckley, Carter Gay, Fred M. Gliner, J. S. Goldback, Andrew J. Kerns, and William N. Thornton

Also stipulations as to testimony which would have been given by P. J. Curran, William B. Ittner and R. M. Milligan.

Also the exhibits which have been previously referred to in the depositions just mentioned, which have been identified and marked as follows:

"Plaintiffs' Exhibit A, Callahan Memory Sketch."
"Exhibit B, Callahan Drawing."
"Exhibit C, Photograph of Timkin Apparatus."
"Exhibit D, Callahan, November 20, 1908, Drawing."
"Exhibit E, Kerns Sketch."

[fol. 65] We have an agreement that photostats or prints of originals are to be used instead of the originals.

Mr. Jones: The objections of record are repeated.

(Plaintiffs close.)
(Testimony closed.)

DEPOSITIONS OF H. M. KEBBY AND ROBERT TIBBITTS TAKEN ON BEHALF OF THE PLAINTIFFS—Filed February 8, 1922

STATE OF CALIFORNIA,
City and County of San Francisco, ss:

H. M. Kebby, of the City of Alameda, County of Alameda, State of California, and Robert Tibbitts, of the City and County of San Francisco, State of California, residing more than 100 miles from the place where the trial of this action will occur, witnesses called on behalf of plaintiffs herein, being duly cautioned and sworn to testify the whole truth, and being carefully examined, depose and say as hereinafter set forth.

Arther M. Hood, for plainffs;
George P. Barton, for defendants.

HARRY M. KEBBY deposes and says as follows:

Direct examination by Mr. Hood:

Q. 1. Please state your name, age, residence and occupation?

A. Harry M. Kebby, 2127 Eagle Avenue, Alameda, California; civil and mechanical engineer; age 61.

[fol. 66] Q. 2. How long have you been a practising engineer?

A. Forty years.

Q. 3. You were intimately connected, as an engineer, with the development of the cable railways systems of San Francisco and at various other points in the United States, were you not?

A. Yes.

Q. 4. Were you employed in any capacity in connection with the construction of pier 38 on San Francisco water front, if so

please state what your position was, and briefly the character of your duties?

A. Yes, as chief inspecting engineer for the State Harbor Commission. Duties to superintend the construction of the work, and see that the contract was carried out as per specifications.

Q. 5. While you were engaged in that work did you take any photographs of the job as it progressed?

A. Yes.

Q. 6. I hand you a panoramic photograph consisting of three sections asking you to state what that is, when the original negative was taken, and by whom?

A. This photograph which was taken by myself represents the condition of the work on the date marked on the photograph.

Q. 7. And what is that date?

A. May 25th, 1909.

Q. 8. And of what pier is that a photograph?

A. Pier 38.

By Mr. Hood: Counsel for plaintiffs offers the photograph, just referred to by witness, as Plaintiffs' Exhibit O, Kebby, May 25, '09. Photo of Pier 38.

Q. 9. Will you please describe briefly the tower apparatus at the right of the group of four towers at the right-hand end of Exhibit O? [fol. 67] A. This represents a hoisting apparatus used for lifting concrete from the mixer to a hopper fastened to the upper part of the structure, from where it was dumped through a suspended pipe into the cylinders below.

Q. 10. I notice that you said in your last answer that the hopper was fastened to the upper part of the structure. Please describe briefly the construction of this hopper and the manner of its association with the tower, and state whether or not the construction was such that the hopper could in any way be vertically adjusted on the tower?

A. The hopper was fastened to the tower by means of timbers bolted to the tower structure and was connected through a runway in the interior of the tower so that the bucket when it was elevated containing the concrete would be dumped automatically when it arrived at the proper height. The hopper could not be shifted in any direction, as it was bolted fast to the tower.

Q. 11. How were the platform timbers which supported the hopper braced, or supported?

A. They were either spiked or bolted.

Q. 12. I hand you another photograph asking you to state what it is, and who took the photograph, and when?

A. This is a photograph taken by myself on April 8, 1910, showing a similar tower built on the same lines, and used for filling a bottom dump bucket for depositing concrete under water in a bulkhead sea wall.

Q. 13. Is the tower apparatus at the left-hand end of this photograph the same tower apparatus as is shown at the right-hand end of Exhibit O?

A. No, but it is shown at the left-hand end of pier 38 panorama.
[fol. 68] Q. 14. How did these two devices compare as to structure, in the manner in which the tower hopper was supported, the manner in which the discharge pipe was connected to the hopper, and other general details?

A. For all practical purposes they were of the same type of construction.

(Counsel for plaintiffs offers the photograph referred to in Q. 13 as Plaintiffs' Exhibit P, Kebby, April 8, 1910, photo.)

Q. 15. I notice in Exhibit P immediately under the hopper platform a sort of supplemental tower structure, which I mark with a reference letter A. Will you please state what that is?

A. Just a support for the hopper. The same construction is shown in the pier 38 machine first described, at the extreme right of Exhibit O.

Q. 16. I have marked with the letter B a portion on Exhibit P. What is that part?

A. The hopper, made of steel.

Q. 17. And what are the parts C and D?

A. Part C is an enlarged funnel-shaped end constructed on pipe D. This funnel-shaped end C has hooks riveted on, to which are fastended chains running to hopper B, to support the pipe and hold it suspended from hopper B.

Q. 18. Please state whether or not parts, like parts A, B, C and D, were in the tower structure at the extreme right-hand end of Exhibit O?

A. Yes. They were of the same design.

Q. 19. What carried the tower structures, mixer, hoist hopper and pipe which you have been describing?

A. A barge floated in the water.

Q. 20. As I understand it, the part A was connected to and formed a part of the hopper support, is that right?

[fol. 69] A. It was the only support for the hopper.

Q. 21. How many chains were there connecting part C with the hopper B?

A. Four.

Q. 22. How were they spaced?

A. At 90 degrees apart.

Q. 23. Please state whether or not there was any gate structure by means of which flow from the hopper to the pipe C-D could be controlled?

A. No, there was not, as the concrete was never held in the hopper.

Q. 24. What was the character of concrete mix which was used in the fabrication of pier 38?

A. The concrete used in pier 38 was a practically dry mix, and the inspectors had orders to hold them up if they allowed the concrete to become too wet.

Q. 25. With the chain connection between the parts B and C about how much movement or swing of the pipe D could be had?

A. It could only be swung a short distance, and had to be held in the new position or it would swing back to its orignal position.

Q. 26. When the pipe D was swung to one side or another, what happened to the chain connections between parts B and C? Did they all remain tight or did some of them have slack in them?

A. The chain connections between B and C were constructed of special Norway iron, in order to make them strong enough so that when the pipe was swung from the vertical position two of the chains would carry the load, as either one or two were bound to become slack when the pipe was moved.

Q. 27. In the operation of this device, in the fabrication of pier 38, at what angle to the vertical was the pipe D used?

A. The pipe in practically all cases hung vertical.

[fol. 70] Q. 28. Please describe briefly the operation of preparing for and delivering concrete from the hopper B to a point of deposit in the pier structure?

A. In the construction of these concrete cylinders the first operation was placing a steel cylindrical caisson, which was then driven to a sufficient depth to stop the penetration of water or silt, which might be forced in from outside pressure. This cylinder was then cleaned of water and mud by means of an orange peel bucket, which was operated from either the same or another floating pile-driving machine. When the water and mud had been excavated down to hard bottom men were lowered with picks and shovels to complete the excavation until a satisfactory hard bottom had been reached. This machine then moved out of the way and another floating pile-driving machine picked up from the water a circular wooden concrete form, inside of which was fastened the steel reinforcing. This was placed in position on the lines run by the engineers, and braced in this position, and the machine then moved away and the floating concrete barge moved into position against the cylinder and deposited the concrete. The concrete was dumped from the hopper already described through the pipes into another steel hopper held at the top of the form, and from this hopper a number of short sections of pipe were suspended. At the bottom of the cyliner a man was kept all the time so as to distribute and tamp the concrete as it fell through this pipe. As the concrete in the cylinder raised this man had to remove short sections of the pipe so that the pipe would not be buried in the concrete. The man being suported by the concrete below necessitated the concrete being kept in a practically dry condition; otherwise the man would sink too deep in the concrete.

Q. 29. When one of the cylinders was completed what was done [fol. 71] with the barge, preparatory to the placing of concrete in another cylinder?

A. About the time that the concrete barge was through filling one cylinder the before-mentioned machines would have another cylinder ready for concrete and the barge would be moved up to the same position relative to the new cylinder.

Q. 30. And what was the approximate condition of the pipe D relative to the vertical angle during the delivery of concrete from hopper B to the cylinder?

A. The pipe D hung vertical.

Q. 31. Please state whether or not the construction was of such character that the pipe D could be practically held or caused to remain at a fairly flat angle, say less than 45 degrees from the horizontal?

A. No, it could not.

Q. 32. Please state what is the part which I have indicated by the letter E in Exhibit P?

A. This was a wooden strut placed behind pipe D so that it would reach far enough to fill the bottom dump bucket, shown in the center of the picture.

Q. 33. Please state whether or not the part E in Exhibit P had a double pivot jointed connection with the tower structure?

A. No, it had not.

Q. 34. Then as I understand it this part E was just a temporary stick crowded in between the pipe D and the tower, is that right?

A. That is correct.

Q. 35. I hand you another photograph on which I have marked the various parts C, D and E, and ask you to state whether or not those parts correspond with the parts similarly designated in Exhibit P.

A. They are photographic representation of the same machine shown in Exhibit P.

Q. 36. Please state who took this photograph, and when?

[fol. 72] A. I took this photograph myself on February 24, 1910.

By Mr. Hood: Counsel for plaintiffs offers in evidence the last-mentioned photograph as Plaintiffs' Exhibit Q, Kebby, February 24, 1910, photograph.

Q. 37. Please state whether or not you have had these Exhibits O, P and Q, continuously in your possession since the dates which appear on said photographs?

A. I have since they were printed.

Q. 38. What sort of a deck did pier 38 have?

A. Reinforced concrete, carried on steel beams, covered with concrete.

Q. 39. How was the concrete for the deck of pier 38 placed?

A. By mixing on the barge shown on the left of Exhibit O, hoisted through the tower, dumped through the hopper and pipe into a stationary or semi-stationary hopper on the deck below. From this hopper it was dropped into wheeled concrete buggies and wheeled to place, and then leveled and tamped.

Q. 40. Is there anything in Exhibit O which shows the manner of distributing the concrete for the deck? If so, please state what it is?

A. Exhibit O shows one man wheeling a buggy of concrete on the runway over to the far side of the pier from the mixer, and there shows a man with a shovel waiting to distribute the concrete.

Q. 41. Please indicate the man wheeling the concrete, by the letter F, and the man placing the concrete by the letter G.

A. I have done so.

Q. 42. Can you state the approximate time when the placing of concrete in the cylinders for pier 38 was begun?

[fol. 73] A. During the months of January or February, 1909.

Q. 43. Did you ever do any work on piers 42 and 44, on the San Francisco water front?

A. No.

Q. 44. I understand that at some time subsequent to the completion of those piers they were reconstructed, and the original concrete cylinders taken away. Did you have anything to do with that work?

A. In your previous question I thought you were referring to the original construction, of piers 42 and 44. I had charge for the State Harbor Commission of the reconstruction of piers 42 and 44. The original concrete cylinders of piers 42 and 44 were gradually falling down, as the teredos got at the piles supporting the cylinders and destroyed them. The engineering department of the State Harbor Commission arrived at the conclusion that it would be policy to remove all of these cylinders before serious damage was done, and replace them with creosoted wooden piles. The original steel beams and the wooden deck were left in place, except as to necessary repairs which had to be made. This was approximately during 1916 and 1917.

Q. 45. What was the character of the concrete in the cylinders which were removed at the time of removal?

A. Some of it was intact. The majority of it fell to pieces when the original forms were cut off.

Q. 46. Please state whether or not from your experience as an engineer, the condition of those cylinders, at the time of their removal, would indicate the character of original mix, as to whether it was wet or dry?

A. I could not say.

[fol. 74] Q. 47. In the apparatus used on pier 38, was there any connection, I mean mechanical connection, between the strut E and the tower structure?

A. No.

Q. 48. I notice in Exhibit Q a man standing just to the left of the lower end of pipe D. Can you tell from the photograph what this man was doing? If so, please state what?

A. This man, by means of a line, attached to the pipe, pulled it to one side, so that the bottom dump bucket could be picked up by the derrick, after being filled.

Q. 49. Please state whether or not the construction of hopper B and pipes C and D, and strut E, in the apparatus used in the fabrication of pier 38, was of such character that the lower end of the pipe D being deflected to one side or another from its medial position, it would remain in the deflected position without the application of some external force or means, such, for instance, as the man you have just mentioned?

By Mr. Barton: Question objected to as leading.

A. No, it would not.

Cross-examination by Mr. Barton:

X Q. 50. Did you ever work for Mr. Charles T. Yerkes, formerly of Philadelphia and of Chicago?

A. I did, through the engineering firm of Wright and Meysenburg.

(Cross-examination closed.)
(Deposition closed.)

Harry M. Kebby.

[fol. 75] HARRY M. KEBBY, being recalled, testifies as follows:

Direct examination by Mr. Hood:

Q. 1. My Kebby, in your previous examination which has just been closed, I forgot to show you Defendants' Exhibit 61, which has been offered in evidence by defendants as illustrating an apparatus alleged to have been used in the fabrication of piers 42 and 44, and then, at a later time, used in the fabrication of pier 38. I hand you this exhibit and ask you to state whether or not you understand the mechanism illustrated by the drawing?

By Mr. Barton: The question is objected to as leading, and it is believed the statement of the question is not accurate.

A. I believe so.

Q. 2. Please state whether or not an apparatus of the character shown in this exhibit, comprising a boom connected to the tower by a mechanical pivotal connection, carried in such manner that it could be vertically adjusted on the tower, and supporting by block and tackle the lower end of a pipe composed of several sections, and flexibly connected at its upper end to a hopper on the tower structure, was ever used in and during the fabrication of pier 38 for the distribution of concrete?

By Mr. Barton: The recital of the question is objected to as leading.

A. It was not.

Q. 3. Please state whether or not any barge-tower concrete mixing apparatus other than those shown in Exhibit O, was used in and during the fabrication of pier 38?

A. No, there was not.

[fol. 76] Cross-examination by Mr. Barton:

X Q. 4. Are you familiar with grain carriers?

By Mr. Hood: Question objected to as not proper cross-examination.

A. To some extent.

X Q. 5. Did you ever see a grain carrier analogous in construc-

tion and mode of operation to any part of the apparatus shown in Fig. 1 of Exhibit 61?

By Mr. Hood: Question objected to as not proper cross-examination.

A. No.

X Q. 6. Did you ever see a grain carrier having a pipe for conveying the grain?

By Mr. Hood: Question objected to as not proper cross-examination.

A. Yes, but not under these conditions.

X Q. 7. Was that pipe hung so that it could be rotated both vertically and horizontally, as illustrated in this sketch?

By Mr. Hood: Question objected to as not proper cross-examination.

A. All of the grain carrying pipes which I have seen worked on an entirely different principle.

X Q. 8. Describe just how this apparatus of Fig. 1 as illustrated is intended to work?

A. The apparatus shown in Fig. 1 is absolutely impractical and will not work at all.

X Q. 9. You understand it, however?

A. I believe I understand what this plan is intended to convey.

X Q. 10. Well, go on and tell what you believe it is intended to convey?

A. At this point I wish to state that I believe this examination is going into the realms of an expert, and as I have not been employed as an expert in this case I decline to state.

[fol. 77] By Mr. Hood: The witness is advised that this particular question hardly calls for expert testimony. The witness will recall that in the direct examination he was asked if he understood the construction illustrated by Exhibit 61, and then asked if such an apparatus was used in connection with pier 38. Opposing counsel is trying to test you as to whether or not you do understand the illustration, and if you refuse to answer then of course your statement of fact as to the non-use of such an apparatus in connection with pier 38 will not be admissible. Counsel for plaintiffs will appreciate it, therefore, if you will be good enough to show whether or not you understand the construction by giving a description such as has been asked for. In case you are asked questions which really call for an expert opinion I will see to it that you are properly instructed and protected in your rights.

By Mr. Barton: It is submitted that counsel for plaintiffs should not thus in the midst of a cross-examination gratuitously instruct his witness.

A. What I think it is intended to convey—the blue print Fig. 1 shows a boom connected to the tower for supporting the end of

the pipe leading from the hopper. It states that the pipe consists of flexible joints held together by chains. It would be impossible to hold a flexible joint pipe, held together by chains, in the position shown on the drawing, as the flexible joints would sag between the supports from the boom and the hopper into the form of a catenary curve and would not remain straight as shown. Furthermore, there is nothing to show a universal joint connection to the hopper, which they must necessarily have in order to swing this pipe vertically and horizontally.

[fol. 78] By Mr. Barton: The answer is objected to as not responsive to the question.

By Mr. Hood: That portion of the answer beginning with "It would be impossible" and continuing to the end of the answer is objected to as an expression of opinion, the witness not having been produced as an expert. The attention of the witness is called to the fact that the preceding question asked for a description by the witness of the structure intended to be illustrated by Fig. 1. I will appreciate if the witness will, therefore, in response to the question, refer to the various parts of this figure in a brief description, so that the Court will be enabled to determine whether the witness does, in fact, understand the drawing and the mechanism it is supposed to illustrate.

By Mr. Barton: I wish my question to stand as it is without any amendments on the part of counsel for plaintiffs.

(Question read to the witness.)

By Mr. Hood: Question X Q. 8 is objected to, as calling for an opinion as to what somebody else intended. The question should have been for the witness to state his interpretation of the drawing.

By Mr. Barton: I am not prepared to thank counsel for his attempt to amend my question. I ask that the question be read again.

A. As I understand it the apparatus shown in a crude form in Fig. 1, is intended to be used to distribute concrete, mixed below on the deck, dumped into a hoisting bucket, raised and dumped into a hopper at the top of the tower, and then shot through the pipe marked as "flexible joints held together by chains."

X Q. 11. How do you understand is the concrete conveyed into the top of the pipe?

A. I believe I gave that in my previous answer.

[fol. 79] X Q. 12. Please give it again?

A. It is to be raised in a hoisting bucket from the mixer, dumped into a hopper at the top of the tower, and then from the hopper dropped into the pipe.

X Q. 13. How is it dropped from the hopper into the pipe? What special mechanism do you think was intended to be used?

By Mr. Hood: Question objected to as not proper cross-examination, unless it be interpreted as an inquiry as to what the drawing shows, to indicate the intention as to operation.

By Mr. Barton: I object to the virtual instruction of the witness as to an answer he should give when under cross-examination.

A. No mechanism whatever. The concrete would naturally drop into the pipe by gravity. The drawing shows a lever and a memoranda says: "Valve operated from platform with lever." This valve would not assist the concrete to drop into the pipe, but would retard it.

X Q. 14. Is such a valve a common device to be used to control keeping the concrete from a hopper?

A. Yes, but in an entirely different manner from anything which can be guessed at from the arrangement shown.

X Q. 15. With that drawing before you, in view of your experience in such matters, would you be able to either construct or direct the construction of a valve to control the keeping of the concrete from the hopper?

A. Yes, if the concrete was wet enough so that it would flow after being retarded by a valve.

X Q. 16. You could go right on the market, or you could go to any good mechanic and tell what was needed could you not? And have the work of putting in a valve or gate promptly done, could you not?

[fol. 80] A. Yes, but I would not be willing to say that it would work under the conditions shown.

X Q. 17. But your valve would be all right, wouldn't it?

A. The valve would be all right as a retarding apparatus.

X Q. 18. Such valves are, speaking figuratively, as old as the hills, are they not?

A. The gate valve is the oldest known valve there is.

X Q. 19. What would you give as the technical name of the arm extending to the right and upwardly from the tower?

A. I would call it, as it is marked, a boom.

X Q. 20. And do you understand that it was the intention of that drawing, or the one who made it, to show a boom by that illustration, for moving the concrete pipe about horizontally and vertically, as it were, on a universal joint?

A. The boom can have nothing to do with moving the pipe horizontally—only as a means of holding the end of the pipe vertically.

X Q. 21. I was asking you, in view of the legends on the drawing, as to what you consider was the intention of the one who designed the drawing to illustrate with respect to the relations between the boom and the concrete pipe or chute?

A. There is nothing that I can see on this drawing showing that the pipe is to be moved horizontally. A legend on the tower says "Hinge movable up and down, also sideways."

X Q. 22. Has your profession included the evidence as an expert witness?

A. I have been called as an expert on cable railway cases.

[fol. 81] X Q. 23. How do you distinguish between the duties

of a witness when testifying in the ordinary way, or as an "expert" so-called?

A. I could not say, except as to individual cases.

(Deposition closed.)

Harry M. Kebby.

ROBERT TIBBITTS, produced as a witness, as noted above, deposes as follows:

Q. 1. Please state your name, age, residence and occupation?

A. Robert Tibbitts, age 60 years, 16 California Street, San Francisco, contracting and constructing business.

Q. 2. In what business were you engaged in the year 1906?

A. In the construction business, doing a lot of wharf construction for the State on the bay here, at that time.

Q. 3. Of what company were you a member at that time?

A. The Healy-Tibbitts Construction Company.

Q. 4. Did you have anything to do with the orginal construction of piers 42 and 44 on the San Francisco water front, and if so please state briefly what your duties were in the fabrication of those piers?

A. I generally supervised the construction entirely.

Q. 5. By that do you mean that you were directly on that job from day to day in active superintendence of construction work?

A. Yes, in the most part of the work; sometimes I was away.

[fol. 82] Q. 6. Please state how the concrete in that job was distributed from the mixer to the various points, and where the mixer was located?

A. We had a mixing plant located between 42 and 44, what we call the bulkhead. The materials were hauled there and the concrete was mixed and sent out in cars or buggies to the wharf.

Q. 7. Was this bulkhead on the shore edge?

A. Yes.

Q. 8. What kind of a deck did those two piers have when they were done?

A. They had a wooden deck, if I remember rightly.

Q. 9. It has been testified in this case on behalf of the defendants that some of the concrete used in the making of the cylinders for supporting the decks of piers 42 and 44, was distributed by means of a mixing and hoisting apparatus, carried on a barge, this barge having a tower in which there was a hoisting skip, a hopper near the top of the tower, a chute or pipe connected to the hopper, and supported at its outer end by means of block and tackle suspended from a boom which was mechanically pivotally connected to the tower at the lower end of the boom and extended outwardly and upwardly with the block and tackle suspended at the outer end of this boom and extended down so as to support the lower end of the pipe or chute. Please state whether or not such an apparatus was used by the Healy-Tibbitts Company in the distribution of concrete in fabricating piers 42 and 44?

A. We used no floating means at all on 42 or 44. Our concrete was all put in from the top and cars are wheeled out from the mixer that was located on the bulkhead between 42 and 44.

Q. 10. I show you a panoramic photograph which has been [fol. 83] marked in this case as Plaintiffs' Exhibit O, and ask you to state what that photograph illustrates?

A. Well, it's the construction of pier 38, which we practically did it all with floating appliances.

Q. 11. What had you to do with the construction of pier 38?

A. Well, I had charge of the entire works—directed it all in every way.

Q. 12. About when did you begin the placing of concrete in pier 38?

A. Well, from the date of construction on this (witness refers to Exhibit O) I could say it was very shortly prior to this date (May 25, 1909), not over thirty days prior.

Q. 13. At the right-hand end of Exhibit O at the extreme right of the four tower devices, there appears to be a concrete handling apparatus of some kind. Can you describe that apparatus briefly as to what it was?

A. This fourth derrick here is a tower that was rigged to elevate concrete up and get it over the top of the cylinders and put it in cylinders, discharged in a hopper on top and come down through a closed pipe connected together with chains and wire as we saw fit to hook them together.

Q. 14. Do you recall what sort of a connection there was between the pipe and the hopper?

A. Well, we had a large-mouthed hopper built, a female hopper that went over the end of the male hopper that discharged into the pipe.

Q. 15. Do you recall how that female hopper was connected to the male hopper?

A. Well, we just chained it up there so that it had plenty of slack.

Q. 16. Please state whether or not the Healy-Tibbitts Company prior to the beginning of work on pier 38 had ever used a concrete [fol. 84] hoisting and delivering apparatus comprising a tower on a barge, a hopper and a suspended delivery pipe such as is shown in Exhibit O?

A. Now, this derrick on the barge or the tower was the first one that was ever built by the Healy-Tibbitts Company and was built at the start of the contract on pier 38, which was not sixty days prior to this date here (witness points to the date May 25, 1909, on Exhibit O).

Q. 17. Did the Healy-Tibbitts Company have anything to do with the building of pier 40 on the San Francisco water front?

A. No, had nothing to do with pier 40.

Q. 18. Did the Healy-Tibbitts Company build pier 36 on San Francisco water front?

A. No.

Cross-examination by Mr. Barton:

X Q. 19. You are acquainted with Martin T. Brown, are you not?

A. Yes.

X Q. 20. Also Mr. Charles C. Horton?

A. Yes.

X Q. 21. And Mr. Fred Ayer?

A. I know him, he has worked for me, but he has never been a superintendent for me—just a common workman.

X Q. 22. Do you remember of seeing either Brown or Horton or Ayer in connection with the work on piers 42 and 44?

A. Those are only boys that were carrying tools and keeping time for me. They had nothing to do with the work—no more than an office boy here.

X Q. 23. But did you see them or either of them in connection with the work on piers 42 and 44?

[fol. 85] A. Well, I don't know how to answer a question. They were both in my employ and I must have seen them, but I never discussed what I was doing, because they were merely children to me.

X Q. 24. But you did see them while that work was going on and know who they are, didn't you?

A. I haven't any answer for it at all. I don't know as I ever saw Mr. Horton on the work, because it was not his duty to be on there.

X Q. 25. Are you now an officer of the Healy-Tibbitts Company?

A. No, sir.

X Q. 26. When did you sever your connection with the Healy-Tibbitts Construction Company?

A. It was in December, 1910.

X Q. 27. And did you then retire from business, or are you still in business?

A. I am in business now under the firm name of Tibbitts Pacific Company.

X Q. 28. Did the Healy-Tibbitts Construction Company get the name "Tibbitts" from you?

A. Yes.

X Q. 29. Last May I was here and Mr. Brown and Mr. Horton showed me an old barge sunk in the mud in a slip that I think has been a store place for the Healy-Tibbitts Construction Company. Do you know what barge it is that I refer to?

A. Yes, probably this barge here (witness points to the barge carrying the tower at the right-hand end of Exhibit O) was sunk out beyond the sugar refinery.

X Q. 30. That had a tower and was used for placing concrete, was it?

A. Yes, in the cylinders; and at times was used on the top of the wharf by wheeling the concrete in buggies for the floor of the wharf.

[fol. 86] X Q. 31. When did you last see that old barge, or any part of it?

A. Well, not three hours ago.

X Q. 32. What is its condition now?

A. It is completely submerged, except a small part of the top of the tower. I was down to San Mateo this morning, and in driving back I showed my boy this submerged structure with the tower sticking out.

X Q. 33. Was it high tide?

A. No, very near low water, about a third of the tide in.

X Q. 34. When did you see it last prior to this morning?

A. Well, I see that very often. I have a home and drive that way and can't help seeing it close to the road.

X Q. 35. Are you in the business now of placing concrete, building concrete structures?

A. Yes, concrete wharves and structures of that kind.

X Q. 36. What relations, if any, have you with the Insley Company?

A. I don't know the Insley Company, don't know of them at all.

X Q. 37. Did you ever hear of anyone by the name of Insley that had to do with apparatus for placing concrete by gravity?

A. Don't recall any names at all, don't know anybody by that name.

X Q. 38. Did you ever know Hugh W. Bryson, of Los Angeles?

A. No.

X Q. 39. Did you ever hear of the Concrete Appliances Company? [fol. 87] A. No, I don't recall it.

X Q. 40. Did you ever hear of Theodore Emtman?

A. No, I don't recall it.

X Q. 41. Did you ever hear of Lee Callahan, of Los Angeles?

A. No.

X Q. 42. Did you ever hear of Hiram Johnson?

A. Is this pertaining to—I know Hiram Johnson.

(Cross-examination closed.)

(Deposition closed.)

Robert Tibbitts.

It is stipulated by and between counsel for the respective parties that counsel for plaintiffs may retain Exhibits O, P, and Q in order that copies of the same may be prepared for counsel for defendants.

(Plaintiffs rest.)

STATE OF CALIFORNIA,
City and County of San Francisco, ss:

I hereby certify that on the third day of February, 1922, before me, Eugene P. Jones, a notary public in and for the above State, city and county, acting as special examiner, by agreement of counsel, at Room 419 Crocker Building, City of San Francisco, personally appeared, by agreement of counsel for the respective parties, between the hours of 10 A. M. and 3 P. M., the witnesses, Harry M. Kebby and Robert Tibbitts, and Arthur M. Hood, Esq., appearing

for plaintiffs, and George P. Barton, Esq., appearing for defendants, and the said Harry M. Kebby and Robert Tibbitts, being by me first duly cautioned and sworn to testify the whole truth, and being carefully examined, deposed and said as in the foregoing annexed depositions set out.

[fol. 88] I further certify that the said deposition of Harry M. Kebby was begun at 10 A. M. on the third day of February, 1922, and completed at 12.30 P. M. on that day, and that the deposition of Robert Tibbitts was begun at 2 P. M., and concluded at 3 P. M.

I further certify that the several exhibits referred to in said deposition, to wit: Plaintiffs' Exhibits O, P and Q, were offered in evidence, and marked for identification as set out in said deposition, and, in accordance with the stipulation annexed hereto, delivered by me to counsel for plaintiffs.

I further certify that the said depositions were then and there reduced to typewriting under my personal supervision, and were, after they had been reduced to writing, subscribed by the respective witnesses, and the same have been retained by me for the purpose of sealing up and directing the same to the clerk of the court, as required by law.

I further certify that the reason why the said depsoitions were taken was that the said witnesses reside at Alameda, California, and San Francisco, California, respectively, more than 100 miles from Philadelphia, Pennsylvania, the place where this cause is to be tried.

I further certify that I am not of counsel nor attorney to either of the parties, nor am I interested in the event of the cause.

I further certify that the fee for taking said deposition, $36.50, has been paid to me by the plaintiffs, and the same is just and reasonable.

Witness my hand and official seal at the City and County of San Francisco, this third day of February, 1922.

Eugene P. Jones, Notary Public, Acting as Special Examiner.

(Seal.)

[fol. 89] DEPOSITIONS OF CHARLES C. HORTON AND FRED L. AYER ON BEHALF OF DEFENDANTS—Filed February 8, 1922

Testimony on the part of defendants taken, pursant to order of the court and by agreement of counsel, at No. 419 Crocker Building, San Francisco, California, before Eugene P. Jones, a notary public acting as special examiner, beginning at 10 a. m. Wednesday, February 1, 1922.

Present: George P. Barton, Esq., for defendants; Arthur M. Hood, Esq., for plaintiffs.

By Mr. Barton: I offer in evidence certified copy of certain minutes or proceedings of the Board of State Harbor Commissioners of San Francisco; for convenience, copied upon the record as follows:

Commissioners: John H. McCallum, President; H. H. Cosgriff, F. S. Moody, Hilda Gohrman, Sec'y.; Jas. Byrne, Jr., Asst. Sec'y.; Daniel A. Ryan, Attorney; Frank G. White, Chief Engr.

(Copy)

Board of State Harbor Commissioners, San Francisco, California, Office of the President

San Francisco, May 18th, 1906.

The Board of State Harbor Commissioners met this day pursuant to call of the President.

Present: Messrs. Spear & Mackenzie.

Absent: Mr. Crocker.

[fol. 90] The minutes of the meeting of May 16th, 1906, were not read.

Agreem't with Healy, Tibbitts & Co. of Bonus for Speedy Completion of 42 & 44

Pres. Spear presented an agreement dated April 29th, 1906 entered into with Healy, Tibbitts Co. whereby a bonus of $5,000.00 was to be paid to them in consideration of the completion, with certain exceptions, of Piers #42 and 44 within two weeks from date thereof.

It was ordered filed and the action of the President was approved, ratified and confirmed.

Agreem't with S. P. Co. to Pay $5,000 Rent for Piers 42 & 44 to Aug. 1st, 1906. R. P. Schwerin's letter

President Spear also presented an agreement with the Southern Pacific Co. wherein it was agreed that in consideration of its being granted the use of Piers #42 and 44 for three months from and after May 1st, 1906, it would pay to this Board the sum of $5,000.00 bonus promised to Healy, Tibbitts & Co. for the completion of Piers 42 and 44 in two weeks from April 29th, 1906. Said bonus to be paid as rental of said piers 42 and 44 to Aug. 1st, 1906. Accompanying same is a letter from R. P. Schwerin, Vice President and Gen'l Mgr. Pac. M. S. S. Co. consenting and agreeing to the renting of said piers to the S. P. Co. for three months from May 1st, 1906.

They were ordered filed and the action of the President was approved, ratified and confirmed.

Healy, Tibbitts' Bill for $5,000 Bonus Allowed

Healy, Tibbitts & Co. present Bill for $5,000.00 bonus for completion of Piers 42 & 44 as before mentioned. The Southern Pacific [fol. 91] Co. having entered upon the occupancy of same as above mentioned the Bill was allowed and ordered paid and the Secretary

was directed to present Bill to S. P. Co. for said bonus as rent in accordance with the agreement therefor.

On motion of Mr. Mackenzie seconded by Mr. Spear, the Board adjourned subject to the call of President Spear.

Attest: John M. Foy, Secretary.

I hereby certify that the above is a true and correct copy of the minutes of the meeting of the Board of State Harbor Commissioners held May 18th, 1906, Volume 17, pages 146 and 147.

James Byrne, Jr., Asst. Secretary. (Seal.)

It is agreed by counsel of the respective parties that if James Byrne, Jr., were called as a witness he would testify that he resides in San Francisco, California, that he is now, and has been since 1905, assistant secretary for the Board of State Harbor Commissioners of the State of California; that the minutes of the said board as copied above, were taken from the official records, of which he is in charge; that he personally remembers the fact that the transaction of the board recited in said minutes actually took place, and that he would testify further, as follows:

"I am Assistant Secretary of the Board of State Board of Harbor Commissioners having control of the harbor front of the City and County of San Francisco; I was Secretary in 1906; prior to the San Francisco fire of April, 1906, the Healy-Tibbitts Construction Company commenced the construction of piers 42 and 44 located on said harbor front and, at the time of said fire, said piers were [fol. 92] about completed, with the exception of the deck of wood; shortly after the fire, and during the month of May, 1906, said Board granted to the Southern Pacific Railroad Company the right to occupy and use said piers and during the months of May, June and July of 1906, the said company commenced its occupancy and use of said piers; I annex hereto and make a part thereof, a copy of the minutes of a meeting of said Board, held on the 18th day of May, 1906, and relating to the use of said piers by the Southern Pacific Company."

CHARLES C. HORTON, the first witness, being first duly sworn, replies to question of counsel as follows:

By Mr. Barton:

Q. 1. Are you the Charles C. Horton who gave a deposition in this cause May 26, 1921? I call your attention to the printed deposition.

A. I am.

Q. 2. I call your attention to a certified copy of the minutes of the Board of State Harbor Commissioners dated May 18, 1906.

In that paper there is a reference to your company having been paid a bonus for the completion of piers 42 and 44, the same piers which were referred to in your deposition which is printed. Will you go on and state what the facts are with reference to the completion of that job, and the payment of the bonus referred to?

A. On account of the fire of April, 1906, it was necessary for the Southern Pacific Company to have additional storage space, and we made an agreement with the Board of Harbor Commissioners to allow them the use of the warehouses on piers 42 and 44 previous [fol. 93] to completion and acceptance, with the understanding that we would be paid $5,000 to cover the extra cost of completion while occupied.

Q. 3. And did you go on and complete that job as stated in this certified copy of the minutes?

A. We did.

Q. 4. And what was the date of the completion of that job, that is to say, piers 42 and 44?

A. I cannot fix the exact date without reference to the records of the Harbor Commission, but it is about June, 1906.

Q. 5. And what do we understand by completion? Was all your work done with respect to the placing of concrete?

A. Our work was entirely finished and all the concrete was placed.

Q. 6. What is the deck of a pier of that kind?

A. You mean the interpretation of the word deck?

Q. 7. Exactly.

A. It is the floor of the pier.

Q. 8. What is the superstructure?

A. It is the shed above the floor of the pier.

Q. 9. Was the shed a part of your contract?

A. It was.

Q. 10. And when was that completed?

A. As I have previously testified. I mean the shed was a part of the contract and everything was finished about June, 1906.

Q. 11. The shed was of wooden construction?

A. It is a wooden frame and wooden exterior.

Q. 12. You have in your previous deposition referred to the placing of the concrete by means of a barge, on which was a tower, etc. Can you state whether the placing of the concrete was all finished prior to the earthquake and fire?

A. It was all finished—there may have been a few odds and ends to do, that's all.

[fol. 94] Q. 13. This suit has been on hearing, I am informed, at Philadelphia, and at that hearing one Frederick E. Engstrum was examined as a witness for plaintiffs. I call your attention to his deposition, particularly to his answer to questions 24 to 32. Have you read those questions and answers?

A. I have.

Q. 14. State if you know what the facts are as to the Healy-Tibbitts Company employing the Concrete Appliances Company or the Parrott Company to design such apparatus as is referred to by Mr. Engstrum?

By Mr. Hood: Question objected to as assuming. There has been no testimony that either of said companies was "employed."

A. I know that the Healy-Tibbitts Construction Company did not pay the Concrete Appliances Company or Parrott Company any royalty. I do not know, however, whether these people upon their own initiative prepared drawings of the concrete barge distributing plant in order to secure business from it. This is very often done, and it may have happened in this case.

Q. 15. Will you state whether, to your knowledge, the Healy-Tibbitts Construction Company has paid royalties to anyone on account of any such concrete placing apparatus as you have described, and as is described in the Engstrum testimony?

A. We have paid no royalties unless it is included in the quoted price of equipment of this kind that we have bought.

Q. 16. I'll ask you the broad question as to whether you or the Healy-Tibbitts Construction Company ever recognized as valid the patent in this suit, which relates to placing concrete by a tower and a pipe controlled by a boom?

[fol. 95] By Mr. Hood: Question objected to, as it does not appear that this witness has any knowledge of the particular patent in suit.

A. The matter has never been brought to our attention one way or the other.

Q. 17. Is it a fact that since the Healy-Tibbitts Construction Company used the barge and apparatus that you testified to in your previous deposition that you have gone ahead as occasion required and built or bought concrete-placing apparatus of that type; that you are now using such apparatus, which includes a tower, a trough or pipe for conveying the concrete, a boom for controlling the said pipe, and the usual apparatus that goes with such an outfit?

By Mr. Hood: Question objected to as assuming alleged facts which have not been proven; as leading; and as immaterial, because the structure defined by the question is incomplete.

A. One unit of our equipment consists of a concrete distributing plant on a barge, which is equipped with the Insley distributing trough, boom, etc.

Q. 18. Is it a fact that you have used such apparatus right along since 1906, varying possibly as to details?

By Mr. Hood: Last objection repeated.

A. This particular barge that I refer to was not built until about five or six years ago, and has been used off and on since then.

Cross-examination (without waiver of objection) by Mr. Hood:

X Q. 19. You are not prepared to say that neither Mr. Engstrum nor the Parrott Company negotiated with the Healy-Tibbitts Company with the idea of attempting to interest the Healy-Tibbitts Com-

pany in the use of a concrete distributing apparatus which would [fol. 96] embody a barge, a tower, a hopper vertically adjustable on the tower, a boom, pivotally supported on the tower in such manner that it could be swung from side to side and also in such manner that it could be moved up or down on the tower at its pivot point, so as to maintain a desired relationship with the hopper, a chute associated with the hopper in such manner as to receive the hopper discharge, and supported by the boom, so that the chute would swing from side to side as the boom was swung, and the hoisting bucket mounted in the tower so as to raise mush concrete from the bottom of the tower and dump it into the hopper, are you?

A. Do I understand from your question that you want to know whether Engstrum or the Parrott Company ever took up with us the purchase or use of the plant as described above? Is that the question?

X Q. 20. Yes, in substance, although my question as to whether or not you are prepared to deny that said negotiations were had.

A. Quite on the contrary. I believe they did discuss this matter with us.

X Q. 21. And at that time your company when distributing or laying concrete at quite some distance from the mixer or hoisting apparatus, was delivering the concrete from the hoisting apparatus into a hopper and from a hopper into wheelbarrows and then wheeling the concrete to the distant point?

A. Not in wheelbarrows, but in ore cars; that refers only to part of the work.

X Q. 22. That is the case wherever the concrete was being laid at a point say more than a few feet away from the hopper discharge?

A. Generally that was the case. Yes.

X Q. 23. Now isn't it a fact, Mr. Horton, that at the time of those [fol. 97] negotiations it was a new proposition with your Healy-Tibbitts Company to consider the idea of chuting a very wet mix for a considerable distance from the hopper through chutes, to a point of deposit a considerable distance from the hopper?

A. I would say it was to chute the mixure a considerable distance, yes.

X Q. 24. Your testimony which was previously given in this case relative to the precise character of the chuting apparatus which you describe in your previous testimony, was given from memory, both as to the character of the apparatus and the time of its use, is that right?

By Mr. Barton: I suggest that counsel for plaintiffs refer to the particular testimony which he may have in mind.

By Mr. Hood: May counsel for plaintiffs understand that the witness at the present time is to be considered as having affirmed the deposition which he has previously given in the case?

By Mr. Barton: My point is that the witness has the privilege of knowing just what part of his deposition is referred to. A general question like that is hardly fair to the witness, or may not be. That is all.

By Mr. Hood: The witness is shown a printed copy of the pre-

vious deposition in response to the request of counsel for the defendants.

A. I have tried to make it clear throughout my previous depositions that I do not consider myself competent to give any detail in reference to any individual part of the concrete mixing plant in question. This is due to the fact that many years have elapsed during which time other propositions have come up, and I have forgotten the detail of construction of the outfit in question. Further than this I am not an outside man, and did not come in daily con- [fol. 98] tact with the rig in question while operating, and therefore have only a general knowledge of what took place.

X Q. 25. Then it might even be that the apparatus which you attempted to describe in your previous deposition is not in fact accurately described by you?

A. I would say that the apparatus previously described is subject to the mistakes that may arise in the man's memory concerning something that took place fifteen or twenty years ago.

X Q. 26. And it might even be that this barge apparatus, whatever its construction may have been, which you had in mind at the time of your previous deposition, might have been used for the first time in connection with the construction of pier 38 instead of in connection with the construction of piers 42 and 44. Is that right?

A. Well, I wouldn't quite say that, although fifteen or twenty years' time, anything is possible. One job followed the other pretty closely—a few years apart.

X Q. 27. Mr. Robert Tibbitts was the Tibbitts of the Healy-Tibbitts Construction Company during the time when piers 42, 44 and 38 were being constructed, was he not?

A. He was.

X Q. 28. And he was the outside man who had the direct superintendence of actual construction work on these piers, wasn't he?

A. To the best of my recollection he was.

X Q. 29. Do you think it likely that his recollection as to the precise character of apparatus which was used in constructing each of those piers and the time when such apparatus was first used would be more likely to be correct than yours?

A. Well, I wouldn't say any more correct than mine, no. We are either one likely to make a mistake on it.

[fol. 99] X Q. 30. If Mr. Robert Tibbitts should testify that during the construction of piers 42 and 44 the concrete was wheeled from a mixer which was on shore and dumped into the cylinders, and that no tower or barge apparatus was used on those two piers, would you be inclined to believe that perhaps you had made a mistake in your recollection?

A. Part of the job was poured that way, but the outer end of the job was poured from a barge.

X Q. 31. Is it a fact, Mr. Horton, that during the period of 6 or 8 years, beginning say 1904 or 1905, the Healy-Tibbitts Company was engaged in building a very considerable number of piers?

A. They were.

X Q. 32. And there were times when they had several of those piers under construction at one time, in various stages of construction, and shortly after the completion of one they'd begin the construction of another?

A. That has been the program since 1904 up to about 1918. We always had one or more piers under construction.

X Q. 33. It would be pretty easy to become confused as to the character of apparatus that was used in connection with any particular pier, wouldn't it?

A. It surely would.

X Q. 34. And as I understand it you were not intimately connected in the actual construction operations at piers 42 and 44, were you?

A. I was not in charge of any of the construction. My work did not include that part of the business.

X Q. 35. That was Mr. Robert Tibbitts' job?

A. The actual supervision was up to Tibbitts.

X Q. 36. The only concrete work on piers 42 and 44 was the cylinders, and the decks were steel frame work covered wooden planks. Is that right?

[fol. 100] A. That is about right. I think there was some concrete along the railroad track construction, some special beams.

X Q. 37. I suppose you don't know then the particular character of concrete that was used, or whether or not it was tamped in place?

A. I don't believe there was much tamping done. The concrete cylinders that were built in piers 42 and 44 have since failed and been removed. Creosoted piles taking their place. When removing these cylinders the exterior wooden form having been eaten away the concrete was exposed, and it appeared to be very porous, indicating very little if any original tamping.

X Q. 38. That porous condition would also indicate a very dry mix, would it not?

A. It would, yes.

X Q. 39. I understood you to say that several years ago your company purchased Insley Distributing Apparatus for distributing concrete, embodying a tower, a vertically adjustable hopper, with a discharge gate, a hoisting skip, a boom pivoted to the tower and mounted so that it could be raised and lowered to maintain it's position relative to the hopper, and a chute supported by the boom and connected with hopper to receive the hopper discharge,—that's right, is it?

A. That is correct.

X Q. 40. And at the time you purchased that apparatus from the Insley representative something was said about the apparatus being covered by patents, wasn't there?

A. The original equipment was purchased from Lindgren Company, general contractors here, but since then we have purchased extensive repair parts, and the representative of the Insley Com-

[fol. 101] pany, has told me on several occasions that the process was patented,—I mean the apparatus

X Q. 41. This apparatus that you purchased from Lindgren Company was known to be Insley equipment, wasn't it?

A. Oh! absolutely.

X Q. 42. And at the time you purchased it you understood that it was covered by patents, didn't you?

A. My information with reference to this equipment has been that there was a royalty charged on the number of yards placed by this apparatus. I don't know whether I am right about this, but this is what I have always understood.

X Q. 43. Well, you understood that the apparatus that you got from Lindgren was patented apparatus?

A. I knew it.

X Q. 44. If, as you say, a barge apparatus was used to place some of the concrete in some of the outer cylinders of piers 42 and 44, the barge was brought up close to the cylinder, and the pipe from the hopper run down almost straight, so as to discharge into the forms, didn't it?

A. That is my belief now, yes. If it was used to put concrete in a cylinder away from the edge of the barge it may have been that they used a temporary boom of some sort, but in thinking this over I think the outfit we used at that time was very crude.

X Q. 45. As a matter of fact, if the concrete was a very dry mix it couldn't be discharged through a spout or chute, unless that chute was almost vertical, could it?

A. Well, the chute would be almost vertical because I don't think it was ever attempted to spout beyond the second row of cylinders, which would not be over 16 feet inside the face of the dock. Beyond that I would say upon thinking it over that the concrete was spouted [fol. 102] from the vertical pipe to a hopper on the dock and then bucketed to the interior cylinders.

X Q. 46. Then you think that in giving your previous testimony it is possible you may have been confused by later developments and that actually the barge apparatus didn't have that rather flatly inclined chute, supported by the upwardly inclined boom, as shown in the sketch that you had prepared, the boom extending considerably beyond the chute and having a block and tackle suspended from it and supporting the chute?

A. It is possible that that applied to a later job.

X Q. 47. Mr. Horton, do you recall that several years ago Mr. C. A. Garfield, who handles the Insley equipment in this territory, came to see you and tried to interest you in an Insley equipment that was to be placed on a barge, and you expressed some surprise to Mr. Garfield that it would be possible to put such an apparatus on a barge without being top heavy?

A. I remember it perfectly.

X Q. 48. And you were considerably surprised at Mr. Garfield's confidence that an apparatus for chuting concrete for considerable distances from the barge by means of a boom supported chute, a tower, hopper, and a skip, could actually be erected to be a satisfactory piece of apparatus?

A. I was surprised at what Mr. Garfield claimed for his equipment.

Thursday, February 2—2 p. m.

Redirect examination by Mr. Barton:

R. D. Q. 49. From your testimony I assume that your belief as to the time when the barge was used with the boom in constructing [fol. 103] piers 42 and 44, is not so positive or definite as it was at the time you gave your deposition last May, or even at the time when you made an affidavit, which was sworn to, as I recall the first of December last. I will ask you if such is the case if you will state why you feel the uncertainty as to the dates you testified to in your previous depositions? What has occurred?

By Mr. Hood: That portion of the question including the reference to a "boom" is objected to, as not warranted by the testimony, in view of the fact that the witness, on cross-examination has stated that the early apparatus which he had in mind did not contain a boom.

By Mr. Barton: The testimony will show for itself; my memory is that there was no doubt in the mind of the witness at the time he gave his previous deposition about there being such apparatus on the barge as I have referred to in my question and at that time.

A. My mind is more open on the subject now than it was when Mr. Barton originally took it up with me. At that time question of the use of an outfit of this kind had been dormant for 15 or 20 years. Since this case has been brought to my attention I have talked to my associates, and other men who were engaged in the construction of the piers in question, and their versions are so conflicting that in justice to all concerned I want to now say that I am in doubt as to the exact character of the concrete distributing plant that was used on piers 42 and 44.

R. D. Q. 50. You remember that a barge was used there?

A. It is my belief that a barge was used on part of the work.

R. D. Q. 51. And is there a picture in your mind of a barge being used at that time? That is, looking back do you now seem to remember such a barge?

[fol. 104] A. If my company had built only piers 42 and 44, I would say definitely that the barge was used, but since we have had in continuous construction other piers it is hard for me to say definitely the exact kind of equipment used on this specific work.

R. D. Q. 52. I show you Defendants' Exhibit No. 61. It is a blue print and has certain legends written on it. Do you remember the circumstances of the making of the tracing from which this blue print is taken?

By Mr. Hood: The objections previously entered relative to Defendants' Exhibit No. 61 are here repeated.

A. The blue print in question is a reproduction from memory of a concrete barge plant used by my company.

R. D. Q. 53. And who made the sketch,—who directed it?

By Mr. Hood: It is agreed that the objections heretofore entered relative to Defendants' Exhibit 61 shall be considered as entered, without repetition, to all questions and answers in the direct examination of this witness.

A. The sketch was made in the drafting room of our company by one of our engineers, and the data was furnished by myself and our superintendent, Mr. Brown, and represents the equipment we have owned at various times in the past 20 years.

R. D. Q. 54. In your affidavit which I have referred to I note that a reference is made to this drawing. This blue print being lettered in red chalk. The lower portion of the left-hand figure of Fig. 2 being marked "A," and the right-hand portion, at the pivot of the boom being marked "B." With this in mind I ask you to refer to the affidavit of December 1st, and after doing so will you state whether the statements of facts appearing therein were believed by [fol. 105] you at the time, that is December 1st last? For convenience, I copy the affidavit into the record as follows:

"In the District Court of the United States, Eastern District of Pennsylvania

"In Equity. No. 2067

"Concrete Appliances Company et al., Plaintiffs,

v.

John E. Gomery et al., Defendants

"Affidavit of Charles C. Horton on Behalf of Defendants

"State of California,
"City and County of San Francisco, ss:

"Charles C. Horton, being first duly sworn, deposes and says:

"I am the same Charles C. Horton who heretofore testified in the above-entitled cause in May, 1921, at San Francisco;

"My attention has been directed to certain testimony purported to have been given respectively by Messrs. Frank I. Ginsberg, Frederick E. Engstrum and William H. Insley during the trial of the above-entitled cause in Philadelphia during the month of October, 1921;

"With regard to the subject-matter of this testimony, the following are the facts to the best of my knowledge and belief:

"In said testimony, I note that it is contended the inclined concrete distributing pipe, forming a part of the concrete distributing apparatus used by the Healy Tibbitts Construction Company in constructing Piers 42 and 44 as herein testified to by me in May, 1921,

[fol. 106] would say and be inoperative; such contention is refuted by the fact the said apparatus, embracing the said inclined pipe, as illustrated in the sketch, Ex. 61, referred to by me in my said testimony, did operate and was used successfully in carrying on the said construction work during the years 1905 and 1906; the said pipe was composed of sections, each section inserted into an adjoining section with a tight fit between adjacent sections which were held together by chains; in respect to the said sketch, so referred to by me at the time I testified herein, I now note that the same is inaccurate in regard to following details and such inaccuracies no doubt were due to the haste with which said sketch was originally prepared; in such sketch, the lower end of the boom, in figure 1, should be shown, as fastened on top of the horizontal 8 x 8 stick with the vertical pin as illustrated in figure 5 of the sketch; also, the attachment of the boom to the 8 x 8 stick in figure 2 should be reversed as shown; the sideways movement of the boom is around pin A and the vertical movement around pin B; the general lowering and raising of the boom was accomplished by moving the 8 x 8 stick up or down on the side of the tower fastened to the posts by the bolts A, shown in figure 3;

"Regarding the testimony of Mr. Engstrum in respect to the Healy Tibbitts Construction Company having any designs prepared by Parrott & Co. or to the payment of royalties to that company, I am quite certain he is mistaken; if any such transaction occurred, I was in a position to have knowledge thereof, and I am certain that no such designs or drawings were made by Parrott & Co. for my company and that no royalties were ever paid by the Healy Tibbitts Construction Company to Parrott & Co.; I have had the books of the Healy Tibbitts Construction Company examined for the purpose of confirming my own recollection and such examination failed to disclose any such transaction with Parrott & Co.: [fol. 107] it is probable that Mr. Langdon E. Boyle, as the representative of Parrott & Co., endeavored to interest the Healy Tibbitts Construction Company in the concrete appliances handled by his firm during the years 1912 and 1913 but I am certain he was unsuccessful and that the Healy Tibbitts Construction Company never had prepared by Parrott & Co. any designs and never used any designs made by that company and relating to concrete distributing apparatus; I have discussed, with my associates in my own company, and also with Mr. Boyle, formerly of Parrott & Co., the possibility of the occurrence of any such transactions, and their recollections and knowledge confirm my own recollection and the statement of facts above set forth;

"Regarding Mr. Ginsberg's testimony, it is quite possible he never saw and knew nothing of the concrete distributing apparatus employed by my company in the construction of piers 42 and 44 and heretofore described by me; he was never employed in connection with the work carried on at the docks but worked as a foreman of concrete constrction work on one or two building contracts located in the business section of San Francisco and distant from such docks; therefore, there was no more reason for him to know what the Healy Tibbitts Construction Company was doing on the water front or at

any other place than there was for him to know what some other company was doing at some place distant from the particular jobs on which he worked.

"Charles C. Horton.

"Subscribed and sworn to before me, this 1st day of December, 1921. E. R. Conway, Notary Public."

[fol. 108] By Mr. Hood: The question is objected to as wholly improper examination. The affidavit is not in evidence; there is no indication as to the circumstances under which the affidavit was prepared, or whether or not the witness had any more to do with it than to merely sign the same, or whether in fact he did sign it; if the witness did sign the affidavit then the question is grossly leading in character because it is an attempt to put in the witness's mouth a desire to answer.

A. The only uncertainty in my mind at this time is whether the apparatus described in the affidavit referred to and also Exhibit 61 was the same as was used at piers 42 and 44. During the time that has elapsed since then my company has owned four such plants. Our records having been entirely destroyed in 1906, we have nothing to refer to as to the use of the equipment described on those piers, and as previously stated, conflicting statements by men intimately associated with the work has cast a doubt in my mind as to whether the particular equipment as described was used.

R. D. Q. 54. But according to your best memory, I understand that you not only believed, but still believe that your statements in your previous deposition were correct as to the structure in question and as to the time when used.

By Mr. Hood: Question objected to as grossly leading; as being a statement of alleged fact exactly contrary to the present testimony of the witness; and an apparent effort to cross-examine the witness rather than to directly examine him.

A. I am reasonably sure that a barge was used on part of the concrete work, but I am not sure that the boom attachment and other later improvements were a part of the equipment at that time.

[fol. 109] Recross-examination by Mr. Hood:

R. X Q. 55. Did you dictate or personally prepare the affidavit which has been copied into the records as part of R. D. Q. 53 propounded to you in this examination?

A. No, sir.

Re-redirect examination by Mr. Barton:

R. R. D. Q. 56. Did Mr. W. K. White, a patent lawyer, with office in this building, prepare the affidavit for you and go over it with you in detail?

By Mr. Hood: Objected to as irrelevant and immaterial.

A. As I recall it Mr. White called at my office, did talk over what had taken place in court in the East, and returned several days later with the affidavit, which I read over and signed.

R. R. D. Q. 57. You knew, did you not, that the affidavit was of importance, and you expected that it would be filed in court, as it was?

A. A great deal of the uncertainty that has arisen as to my testimony in this case has been created quite recently, due to conversations with men interested in the construction in question since I knew further testimony was going to be taken, it being my aim to, as far as possible, to get at the real facts.

R. R. D. Q. 58. You mean since last December 1st?

A. In the last two or three weeks.

R. R. D. Q. 59. I understand then that you gave Mr. White the data for the affidavit, that he subsequently brought it to you, he having formulated it, and that you understood what was stated in the affidavit when you signed it, and that you believed all the facts set forth therein were correct?

[fol. 110] By Mr. Hood: Objected to as irrelevant and immaterial.

A. I don't believe I gave Mr. White the facts. He was apparently well informed as to what had gone on in court, and discussed particularly the statements made by Engstrum and Ginsberg and the Parrott Company regarding collecting royalties from my company. This I knew to be incorrect, and it was at my suggestion that he went to Parrott and Company and I understand secured additional affidavits from their employees and a Mr. Boyle, a former employee, bearing out my contention.

R. R. D. Q. 60. But you knew what you were swearing to when you signed the affidavit?

By Mr. Hood: Objected to as improper direct examination.

A. I read the contents of the affidavit, and at that time believed the contents to be true.

(Deposition closed.)

Chas. C. Horton.

Fred L. Ayer, the next witness, having been duly sworn, testified for defendants as follows:

By Mr. Barton:

Q. 1. Are you the Fred L. Ayer that gave a deposition in this cause last May?

A. Yes.

Q. 2. At that time you referred to a certain sketch, a blue print of which is before us marked 61. Referring to that sketch you will see a pipe indicated, with the legend: "Flexible joints held together by chains." I ask you to state what was the length of those joints as used in the barge concrete apparatus to which this sketch refers?

A. An average of 6 feet long and 8-inch pipe.

[fol. 111] Q. 3. I'll ask you if you have confirmed these dimensions at any time, and if so when?

By Mr. Hood: Question objected to as calling for a statement of conclusion.

A. Well, I went and looked at the pipe again today, and I see the pipe is the same as was used on the concrete barge.

Q. 4. Now state how that pipe was fitted together? How did the sections articulate with one another?

A. Slip joints, I would say, the same as stove pipe, one joint slipped into another.

By Mr. Hood: Objected to as not the best evidence.

Q. 5. And what can you say as to the rigidity or flexibility of the pipe as thus put together?

A. Well, being in slip joints, one joint in the other four to six inches it makes it very easy to move around. It is on a hinge here (the witness points to the upper joint of the pipe which connects with the hopper).

Q. 6. Do you remember who fitted the boom, or helped fit it?

A. I did it myself.

Q. 7. Describe just what the fittings were?

By Mr. Hood: Question objected to on the ground that the witness has before him Exhibit 61.

A. There is a regular boom fitting, straps on each side of the boom, at the foot of the boom, which sets in a socket which doesn't show on here, fastened by a bolt, which makes it easy to revolve. The outer ends are rigged with blocks and tackle. Block and tackle is right. I have been doing it all my life.

Q. 8. State if you remember about how far the pipe extended from the tower in connection with your work of placing concrete in the cylinders?

A. Well, that depends on how close you are to the ones filled. You can fill off 30 to 40 feet from the shore, depending on the [fol. 112] distance we get from the edge of the wharf.

Q. 9. And how did you move the pipe when you wanted it to extend 30 or 40 feet?

A. By the use of the boom.

Q. 10. You remember, do you, working on piers 42 and 44?

A. Yes, sir.

Q. 11. And you recall the barge with the mixer, the skip, the hopper, the pipe, the gate at the hopper and the boom pivoted to move up and down or horizontally?

By Mr. Hood: Question objected to as grossly leading.

A. I do.

Q. 12. Describe a little more fully how the pipe was connected at the hopper so as to permit of the moving of the pipe by the

boom? You may if you wish make a little sketch of the connection at the hopper.

A. It is an easy matter to explain. The first joint of pipe connecting with the hopper is a little larger than the following one, so as to give plenty of play in any direction.

Q. 13. You remember a joint of pipe that you got for me. It was put in evidence as No. 62. Where did that particular joint come in the actual apparatus?

A. It came at the upper end of the pipe which carried the concrete to the cylinder.

Q. 14. And it was just below the gate of the hopper, was it?

By Mr. Hood: Question objected to as assuming a gate structure which has not been proven. The question is also objected to as leading. Counsel for plaintiff protests against leading questions and insists that the witness be examined properly.

A. Yes, sir.

[fol. 113] Q. 15. And was there a gate operated by a lever at the hopper?

By Mr. Hood: Objected to as leading.

A. There was.

Q. 16. How did the first, or upper regular section of pipe connect with this tapering piece that came next to the hopper? Was it a loose fit or a tight fit?

A. A loose fit joint.

Q. 17. A loose fit joint?

A. Yes, sir.

Q. 18. And was that loose enough so as to permit the pipe to be moved at that joint?

A. It was.

By Mr. Hood: Objected to as leading.

Q. 19. The lower joints of the pipe were different in construction from this upper or tapered section which came next to the hopper, is that correct?

By Mr. Hood: Objected to as grossly leading.

A. They were, the short joint was about 2 feet long, and the other joints averaged 6 feet.

Q. 20. And was the pipe as a whole stiff enough to be moved together by the boom, with the connection between the short piece at the top and the next piece loose enough to act as a pivot?

By Mr. Hood: Objected to as grossly leading.

A. They were, yes, sir.

Q. 21. Please describe something in detail, how the mush or aggregate was gotten into the cylinders? What apparatus, if any, was at or in the cylinder? How did you fill the cylinders?

By Mr. Hood: Question objected to as assuming a fact not proven, in view of the technical use of the term "mush" which has been had in this record.

A. You mean the concrete from the hopper? There is a flexible pipe with joints set down in the cylinder with a little hopper [fol. 114] at the top of it, that is at the top of the cylinder, and the pipe which is carried by the boom lands the concrete in the top of this little hopper, and as the cylinder fills up from the bottom the pipe is raised and joints taken off.

Q. 22. Before beginning to fill a cylinder, then, you put a pipe into it and how large a pipe did you use in the cylinder below the little hopper that you said was placed at the mouth of the cylinder?

A. An 8-inch pipe.

Q. 23. And you could and did move the pipe carried by means of the boom to the little hoppers placed at the top of the cylinder?

By Mr. Hood: Question objected to as leading.

A. Yes, we moved those pipes with the same boom.

Q. 24. How deep were the cylinders, about?

A. From 40 to 60 feet.

Q. 25. How far down towards the bottom did the vertical pipes extend?

A. Well, generally about 30 feet to start with.

Q. 26. And about how far did you, in practice, move the chute or pipe in filling those cylinders? How far from the tower would it extend?

A. Thirty to forty feet.

Cross-examination (without waiver of objections) by Mr. Hood.

X Q. 27. In your direct examination you said that you had recently inspected some pipe sections about 6 feet long. Am I to understand that these sections that you inspected were the very same sections that you say were used on the apparatus which you say was used in connection with building piers 42 and 44 or were they just sections which, according to your memory, were like the sections of the old apparatus?

[fol. 115] A. I couldn't say postively they were the same ones, but they were the same style and they were very old so I presume they were some of the same ones.

X Q. 28. Well, after a pipe of that kind has been used four or five years it looks pretty old, don't it?

A. Yes.

X Q. 29. And after 4 or 5 years' use you couldn't tell with any degree of accuracy whether it was 5 years old or 10 years old or 15 years old, could you?

A. No.

X Q. 30. Now you worked for the Healy-Tibbitts Construction Company on a good many piers on the San Francisco water front, didn't you?

A. Yes, sir.

X Q. 31. Did you work for that company on piers 36 and 40?

A. I worked on 36—yes, sir, I did.

X Q. 32. Both on 36 and 40?

A. Yes, sir.

X Q. 33. Now, as I understand your testimony, you think that the pipe section which was offered in evidence as Exhibit 62, which is an eighth turn elbow, was used on the apparatus in connection with the construction of piers 42 and 44?

A. I do. I remember that very well.

X Q. 34. There were times when the apparatus which you have in mind was used to fill cylinders which were right close up to the barge and tower, weren't there?

A. Yes.

X Q. 35. And in that case the pipe made of the 6-foot sections extended down almost straight up and down from the hopper, that's right, isn't it?

A. Yes.

X Q. 36. Well, now, how could that be accomplished with that eighth turn elbow at the top?

[fol. 116] A. Because the first joint is 2 foot. The hopper is on a eighth turn, 45 degrees, then a 2-foot joint will allow it to go perpendicular. (The witness illustrated this by means of a lead pencil and cigarette, showing the angle.)

X Q. 37. Then it is your recollection that at the small, or lower end of this Exhibit 62, eighth turn elbow, there was a 2-foot pipe that had a flexible connection with the Exhibit 62?

A. Yes.

X Q. 38. And the upper or large end of Exhibit 62 was connected to the hopper by some chains, so that that Exhibit 62 was flexibly suspended from the hopper, is that right?

A. Yes, it is all flexible.

X Q. 39. Do you recall that on that Exhibit pipe No. 62 there were riveted to the sides some pieces of strap iron that had hooks on the upper ends?

A. I do.

X Q. 40. And those strap pieces looked as though they had been broken off at their lower end. Do you recall that?

A. At the time the exhibit was sent away, yes.

X Q. 41. Is it your recollection that when that piece of pipe, Exhibit 62, was actually used, those strap sections had hooks at their lower ends also?

A. Not right at the lower end.

X Q. 42. Well, those strap sections had hooks at the lower end of the straps, although the hooks were not right down at the lower end of the elbow, is that right?

A. Yes, that's right.

X Q. 43. And those lower hooks, which are not now on the exhibit, formed the support of some chains, by which the short 2-foot section was suspended, is that right?

A. That's right.

[fol. 117] X Q. 44. About how much of an angle of movement would the chain connection between the hopper and the upper end of Exhibit 62, permit?

A. Well, I'd say 18 inches to 2 feet from the bottom end of the pipe, that is to say, the bottom end of the pipe could be moved sidewise from 18 inches to 2 feet.

X Q. 45. You mean that the bottom end of the pipe, which you say was suspended from the boom, could be moved sidewise 18 inches or 2 feet because of the flexible chain connection between the upper end of Exhibit 62 and the hopper. Is that right?

A. No. Do you mean the top hopper or the lower hopper? There is two hoppers, one at the lower end of the pipe into the cylinders and one at the top of the pipe.

X Q. 46. There was a hopper which was carried near the upper end of the tower, is that right?

A. Yes.

X Q. 47. And this Exhibit 62 had its upper end connected by chains to the lower end of that hopper, that's right?

A. Yes.

X Q. 48. And then connected to the lower end of Exhibit 62 by a flexible connection formed with chains, there was this 2-foot section that you talked about?

A. Yes.

X Q. 49. And then connected in some manner to the lower end of that 2-foot section was a 6-foot section?

A. Yes.

X Q. 50. And connected with that 6-foot section was another 6-foot section, and so on for several sections?

A. Yes, sir.

X Q. 51. Now, about how many of those 6-foot sections were used, end to end, and supported by the boom?

[fol. 118] A. That depended on the distance we were from the cylinders, 6, 7, sometimes 8.

X Q. 52. About how many of those 6-foot sections were used end to end when you were putting concrete into cylinders which were right up against the barge?

A. I would say 4 or 5.

X Q. 53. So that there would then be a pipe from 26 to 32 feet long extending downwardly from the lower end of this elbow section, Exhibit 62, is that right?

A. Yes, very often we allowed that pipe to go right into the cylinder.

X Q. 54. Now, about how far, from side to side, could you swing the lower end of that section of pipe, due to the flexible chain connection between the upper end of Exhibit 62 and the hopper that was on the tower?

A. I want to get the right meaning. Do you mean from the top of the boom how much the lower end would swing? A radius of 30 to 40 feet. The more you wanted it to swing the more pipe you'd put on it.

X Q. 55. How many chains were there between the upper end of Exhibit 62 and the hopper that was on the tower?

A. Two, one on each side.

X Q. 56. That is to say those two chains were parallel to the face of the tower?

A. Supposed to be.

X Q. 57. Now, if you swung the pipe to one side, that would put all the weight on one of those chains and the other chain would become slack, wouldn't it?

A. Not necessarily.

X Q. 58. Why not?

A. Because there is one on each side.

X Q. 59. Now, Mr. Ayer, we'll assume that this wastebasket represents Exhibit 62, and I suspend it on the fingers of my two hands, as [fol. 119] though my arms were chains, one on each side, now that would be a representation of the way this section of pipe, Exhibit 62, was suspended from the tower hopper, is that right?

A. Yes.

X Q. 60. Now, if you swing the bottom of this basket to one side the upper side of the basket will rise on that side toward which the swing takes place, wouldn't it? That's right, isn't it?

A. Not necessarily, for the reason that we have it on a floating barge, and we move the barge to tip our pipe.

(The witness illustrated by gently turning counsel for defendants from side to side.)

X Q. 61. Do you recall that sometimes in the use of the apparatus which you had in mind, when it was desired to move the lower end of the pipe to one side, a rope was tied to the lower end, and a man pulled on the rope and held it, so as to hold the lower end of the pipe over to one side?

A. Yes, sir.

X Q. 62. And he would stand there and hang on to that line as long as the lower end of the pipe was desired to be off to one side, isn't that right?

A. No, when the pipe was placed in the hopper on the cylinder it stayed there.

X Q. 63. When the lower end of the pipe, in its laterally deflected position, was to remain, it was necessary to hang on to that lower end by some means, such as a line in the hands of an operator, or by being tucked in to the hopper in the upper end of the cylinder, unless the barge was turned as you turned me a moment ago when I had the wastebasket in my hands, that's right, isn't it?

A. If I understand you right it is.

X Q. 64. Will you please read X Q. 63, and see if you understood it correctly?

[fol. 120] A. Yes, that's all right.

X Q. 65. Now, the deck of piers 42 and 44 was made up of a grade of steel, and then wooden planking laid on that steel, is that right?

A. Yes.

X Q. 66. You've talked about some "cylinders." By that do you

mean the concrete pile, or the form in which the concrete was placed, or both?

A. By "cylinder" I mean the large cylinders 5 feet across to hold the concrete intact, some of them are wood and some of them are steel, and sometimes they have a pipe inside of them cut off, and sometimes it extends clear up.

X Q. 67. Then by "cylinder" you mean the cylindrical form into which the concrete was placed?

A. Yes, sir.

X Q. 68. In that work on piers 42 and 44 did they sink a caisson first, and, after clearing it out put the "cylinders" or forms for the concrete inside the caissons?

A. Part of them. We drove some of them without caissons. In some cases in working on piers 42 and 44 we sank a steel cylinder or caisson about 8 feet in diameter and long enough to extend down to hard-pan. Then we cleaned out the inside of this caisson and set our forms for the concrete down in these caissons and filled the forms with concrete. After the concrete was in the form, which as I have said was about 5 feet across, then we pulled the caissons, and this allowed the mud and silt to flow in around the bottoms of the forms which held the concrete. First the steel cylinder is driven, next it is pumped out free of water and mud, then there is a concrete foundation put in the bottom of the steel cylinder, large enough for the wooden caisson to set on top of it, then it is braced inside the steel cylinder to the outside of the caisson to hold it intact. Then the con-[fol. 121] crete is put in by use of the pipe and derrick. In shallow water we set or drive those wooden caissons right down near the shore and don't have to have a steel caisson.

X Q. 69. Is it your recollection that the same barge and tower apparatus which you have in mind is also used in placing the concrete in the cylinders for pier 38?

A. Well, I am satisfied it was, but I don't really recollect offhand now. There were so many of them. I think very likely it was, we always used them.

X Q. 70. As a matter of fact, it would be quite easy to become confused as to the particular apparatus that was used on any particular pier?

A. No, I am not confused.

X Q. 71. But you are not sure just what sort of an apparatus was used in building pier 38?

A. No, I don't recall it.

X Q. 72. Do you remember what kind of an apparatus the Healy-Tibbitts Company used in building pier 40 or pier 36?

A. We used the same gear.

X Q. 73. And you are just as sure of that as you are of the testimony you have given in connection with the apparatus that you say was used on piers 42 and 44, I presume?

A. Yes.

Redirect examination by Mr. Barton:

R. D. Q. 74. How are the 8-inch pipes put into the cylinders; what apparatus did you use?

A. We generally used the boom and derrick.

R. D. Q. 75. The boom itself was adapted to be used as a construction boom or a boom for handling pipes like that?

A. Yes.

[fol. 122] R. D. Q. 76. Do you know when piers 36 and 38 were built?

A. I believe they were started in 1906 and completed in 1907, to the best of my recollection.

R. D. Q. 77. Where were you from the time of the fire for the next year or so?

A. In San Francisco most of the time.

R. D. Q. 78. And were you employed by Healy-Tibbitts Company most of that time?

A. At intervals.

R. D. Q. 79. Didn't you tell me you were in the contracting business for a time? When was that?

A. I was, in 1906.

R. D. Q. 80. And on for a year or so?

A. Well, I'd say the biggest part of a year.

Recross-examination by Mr. Hood:

R. X Q. 81. What kind of a deck was there on pier 38?

A. Steel, wood and concrete.

R. X Q. 82. The wood was on top of the concrete and steel?

A. Yes, the steel first and then wood and then concrete.

R. X Q. 83. You mean that there was a wood floor put on top of the steel frame, and then concrete laid on top of the wood?

A. Yes.

R. X Q. 84. And how was that concrete distributed?

A. And most of the concrete was distributed by the boom device—well part of it, where it was handy.

R. X Q. 85. And I suppose at intervals between times when this barge apparatus was filling the cylinders it was delivering concrete for the floor up close to where the cylinders were being put on?

[fol. 123] A. No, we put on the deck and forms before we put any concrete floor on.

R. X Q. 86. That is, you got all your cylinders placed, then put on your steel frame on top of the cylinders, then built the forms for the concrete floor, and then put on your concrete for the floor?

A. Yes, sir.

R. X Q. 87. And you used the same apparatus which had previously been used for putting concrete in the cylinders, for placing some of the concrete for the floor, is that right?

A. Yes, sir.

R. X Q. 88. And you are as sure of that fact as you are of the correctness of your testimony relative to the apparatus which you think was used on piers 42 and 44, are you?

A. I know it.

R. X Q. 89. About how wide were those piers?

A. My recollection is they were about 80 feet.

R. X Q. 90. Well, if you could chute the concrete 40 feet by this apparatus which you have in mind, why didn't they place all of the floor concrete with this apparatus, working first from one side of the pier and then from the other?

A. We had it in use elsewhere part of the time from both piers. I remember very distinctly that we had a stationary mixer and concrete men wheeled it in in two wheeled concrete wagons part of the time. I remember very distinctly of concrete being wheeled in by concrete men because we had a union dispute between the concrete men and the Pile Drivers' Union.

R. X Q. 91. You have had a good many disputes of that kind, haven't you?

A. We have and they've mostly been settled satisfactory.

R. X Q. 92. Disputes between contractors and labor unions in [fol. 124] San Francisco have been a rather common occurrence in the last 25 years, haven't they?

Mr. Barton: Question objected to as irrelevant.

A. Not very serious disputes until the last 4 or 5 years.

R. X Q. 93. As you recall it the wheeling of concrete for pier 38 was from a mixer on shore, is that right?

A. I have not said anything about pier 38.

R. X Q. 94. About how wide was pier 38?

A. As near as I remember it's between 80 and 100 feet.

R. X Q. 95. What is your recollection as to how the concrete was distributed for the floor slab in pier 28?

A. Well, I believe the biggest portion of it was distributed by concrete men and wheel carts from a mixer on the dock.

R. X Q. 96. Is it your recollection that in building pier 38 the barge apparatus which you say was like Exhibit 61, was the only barge apparatus which embodied a tower and a hopper and a hoisting skip for concrete?

A. They might have had a temporary one, I don't just remember.

R. X Q. 97. That is you don't remember in connection with building pier 38 that they had more than one barge that had a tower on it, equipped with a hopper and a hoisting skip and a concrete mixer?

A. I do not remember that we had more than one at that time.

R. X Q. 98. And your memory is that the one barge-tower-mixer-structure which was used in building pier 38 was constructed like that which is illustrated in Exhibit 61?

A. Well, it might have been improved on a little mechanically [fol. 125] from the first one we had, but practically the same thing, they always improve a little on the second one.

R. X Q. 99. But it is your recollection that the apparatus which was used in constructing pier 38 had a boom and a boom supported sectional chute like that that is illustrated in Exhibit 61, that's right, isn't it?

A. I believe so, we had several temporary rigs with booms and pipes.

R. X Q. 100. But you only had one of such rigs at a time?

A. I believe they had two rigs at a time.

R. X Q. 101. Are you right sure about that?

A. I know we had two rigs, and I don't recall whether this rig of Exhibit 61, was working on pier 38 at the same time that the other one was.

R. X Q. 102. What was the construction of the other rig that you have just referred to?

A. Tower and concrete mixer and donkey engine on the barge, and boom and chute.

(Deposition closed.)

Fred L. Ayer.

By Mr. Barton: Commission closed.

IN UNITED STATES DISTRICT COURT

NOTARIAL CERTIFICATE

STATE OF CALIFORNIA,
City and County of San Francisco,
Northern District of California,
Southern Division, ss:

I hereby certify that on the first day of February, A. D. 1922, before me, Eugene P. Jones, a notary public in and for said State and county, and acting by consent as special examiner, at 419 Crocker Building, San Francisco, California, personally appeared, pursuant to notice and consent of counsel, between the hours of 10 o'clock A. M., [fol. 126] and 5 o'clock P. M., and on sundry days thereafter, the witnesses Charles C. Horton and Fred L. Ayer, of said San Francisco, and George P. Barton, Esq., appearing for plaintiffs, and Arthur H. Hood, appearing for defendants, and the said witnesses being by me first duly cautioned and sworn to testify the whole truth, and being carefully examined, depose and said as in the foregoing annexed deposition set out.

I further certify that said deposition was begun on the first day of February, A. D. 1922, and continued from day to day until the second day of said February, when the same was completed.

I further certify that the said depositions were then and there reduced to typewriting under my personal supervision and were after they had been reduced to writing subscribed by the said witnesses as their deposition in said cause, and that the same had been retained by me for the purpose of sealing up and directing the same to the clerk of the court, as required by law.

I further certify that the reason why the said deposition was taken was that said witnesses reside at San Francisco, California,

IN UNITED STATES DISTRICT COURT

PLAINTIFFS' EXHIBIT N.

PATENT IN SUIT.

128 – 129

L. CALLAHAN.

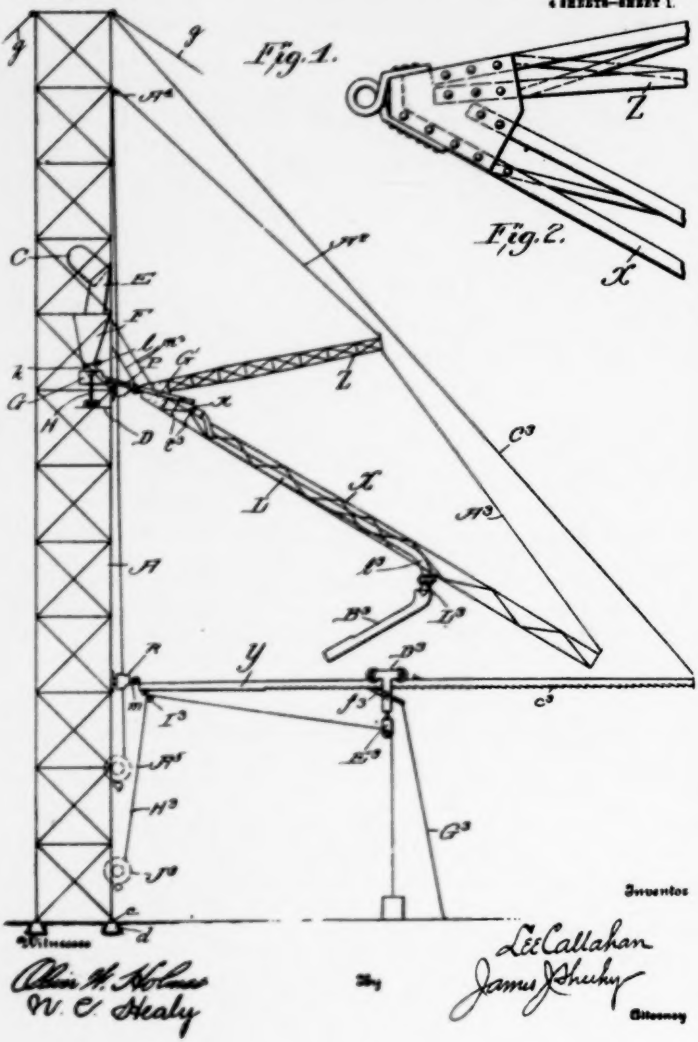
MATERIAL TRANSFERRING APPARATUS.

APPLICATION FILED JAN. 21, 1909.

948,719.

Patented Feb. 8, 1910.

4 SHEETS—SHEET 1.



L. CALLAHAN.

130–131

MATERIAL TRANSFERRING APPARATUS.

APPLICATION FILED JAN. 21, 1909.

948,719.

Patented Feb. 8, 1910.

4 SHEETS—SHEET 2.

Fig. 3.

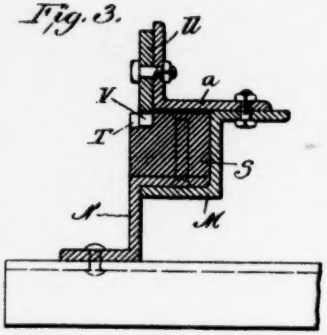


Fig. 3a

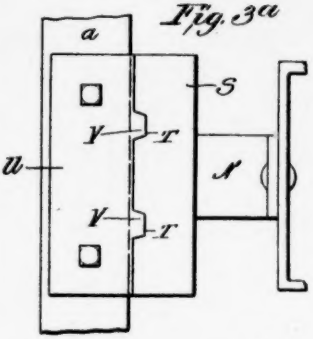
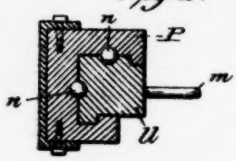


Fig. 4.



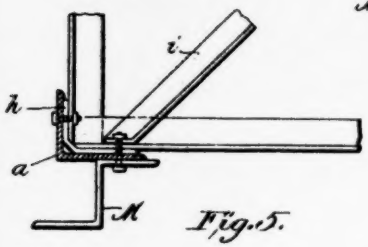
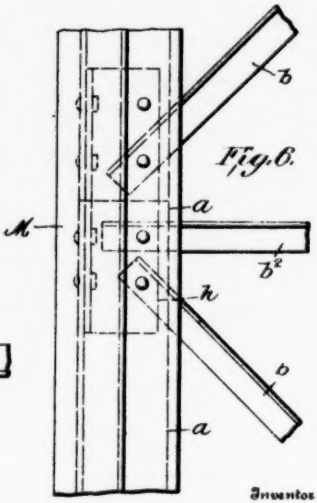


Fig. 5.

Fig. 6.



Witnesses

Alvin W. Holmes

W. C. Healy

Inventor

Lee Callahan

By James J. Shelby

Attorney

132 - 133

L. CALLAHAN.

MATERIAL TRANSFERRING APPARATUS.

APPLICATION FILED JAN. 21, 1909.

948,719.

Patented Feb. 8, 1910.

4 SHEETS—SHEET 1.

Fig. 7.

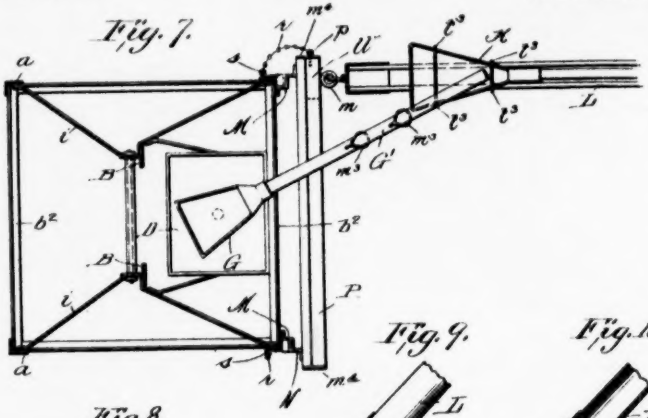


Fig. 8.

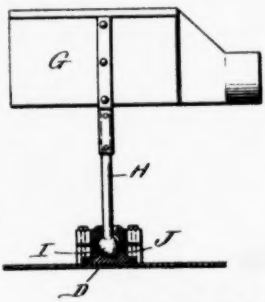


Fig. 9.

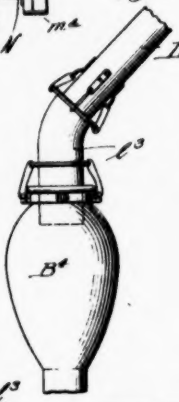


Fig. 10.

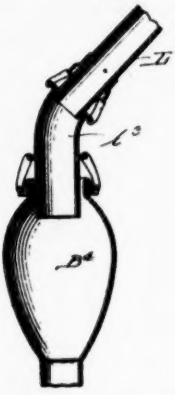
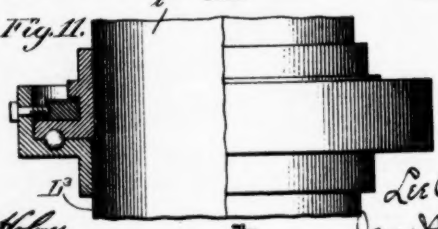


Fig. 11.



Witnesses

Allen W. Holmes

W. C. Healy

Inventor

Lee Callahan.

By James J. Healy

Attorney

L. CALLAHAN.

MATERIAL TRANSFERRING APPARATUS.

APPLICATION FILED JAN. 21, 1909.

948,719. Patented Feb. 8, 1910.

4 SHEETS—SHEET 4.

Fig. 12.

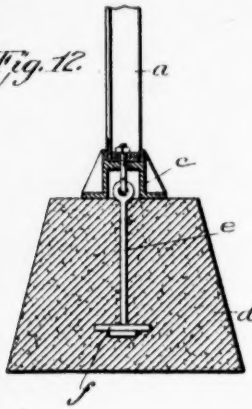


Fig. 13.



Fig. 14.

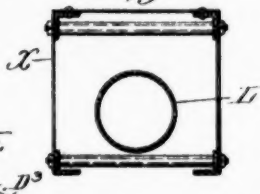


Fig. 15.

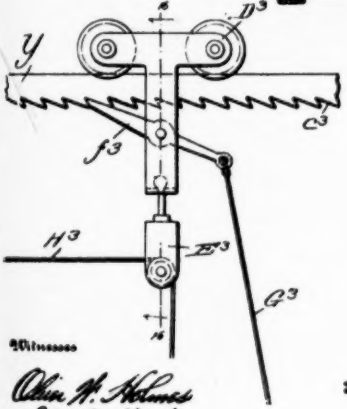
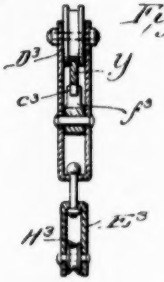


Fig. 16.



Witnesses

Allen H. Holmes

W. C. Healy

By

Inventor

Lee Callahan

James J. Healy

Attorney

UNITED STATES PATENT OFFICE.

LEE CALLAHAN, OF SAN DIEGO, CALIFORNIA, ASSIGNOR, BY MESNE ASSIGNMENTS, TO CONCRETE APPLIANCES COMPANY, OF ST. LOUIS, MISSOURI, A CORPORATION OF MISSOURI.

MATERIAL-TRANSFERRING APPARATUS.

948,719. Specification of Letters Patent. Patented Feb. 8, 1910.

Application filed January 21, 1909. Serial No. 473,461.

To all whom it may concern:

Be it known that I, LEE CALLAHAN, a citizen of the United States, residing at San Diego, in the county of San Diego and State of California, have invented new and useful Improvements in Material-Transferring Apparatus, of which the following is a specification.

My invention pertains to apparatus for supplying materials to buildings in the course of erection; and it has for its general object to provide an apparatus calculated to be used to advantage in transferring concrete or other plastic material from a suitable source of supply to the points desired on a building that is being built.

Another general object of the invention is to provide an apparatus of the kind stated adapted more especially for use when a building is to embody reinforced concrete, and provided with means for transferring plastic material, and also with means for transferring other material from the ground to the points desired on a building in course of construction.

With the foregoing in view, the invention will be fully understood from the following description and claims when the same are read in connection with the drawings, accompanying and forming part of this specification, in which:

Figure 1 is a side elevation of the apparatus constituting the best practical embodiment of my invention of which I am cognizant. Fig. 2 is an enlarged detail view of the plastic-material boom with the conduit omitted. Figs. 3 and 3ª are enlarged detail views showing the manner in which the horizontal tracks are adjustably fixed at different points in the height of the tower. Fig. 4 is a cross-section showing one track and the arrangement of one boom-carriage therein. Fig. 5 is a detail horizontal section, and Fig. 6, a detail elevation of a part of the tower. Fig. 7 is an enlarged horizontal section of the tower. Fig. 8 is an enlarged detail view, partly in section and partly in elevation, showing one of the open pans of the apparatus and the support thereof. Figs. 9, 10 and 11 are enlarged detail views illustrative of conduit connections hereinafter referred to. Figs. 12 and 13 are enlarged detail views showing the manner in which I prefer to fasten the lower ends of the corner uprights of the tower. Fig. 14 is a detail cross-section showing the arrangement of the conduit in the plastic-material boom. Fig. 15 is an enlarged detail elevation of the carriage or traveler on the construction boom. Fig. 16 is a transverse section taken in the plane indicated by the line 16—16 of Fig. 15.

Similar letters designate corresponding parts in all of the views of the drawings, referring to which:

A is the fixed tower of my novel apparatus. The said tower may be of any general construction consonant with the purpose of my invention without involving departure from the same as claimed. I prefer, however, to construct the tower of suitable metal, and in twelve-foot, superposed sections, and to have it comprise corner uprights *a*, of angular form in cross-section, and inclined braces *b* and horizontal braces *b*', of similar form in cross-section, connecting the corner uprights in such manner as to make the tower of rectangular form in cross-section. I also prefer to fix the tower in position in the manner illustrated in Figs. 1, 12 and 13—that is to say, by arranging the corner uprights *a* of the lowermost section in seats *c* arranged on concrete bases *d*, embedded in the ground, and by connecting the lower ends of said uprights and the seats *c* through the medium of bolts *e* with anchors *f* held in the bases *d*. It will also be understood in this connection that guy cables *g*, Fig. 1, extending from the upper end of the tower to fixed objects located about the tower, may be and preferably are employed to assist in maintaining the tower in upright position.

The tower is increased in height as the construction of a building progresses by adding twelve-foot sections, and each added section is fixedly connected with the one below it, preferably through the medium of fish-plates *h* best shown in Figs. 5 and 6.

Arranged in the tower A and connected by struts *i* with the corner uprights *a* thereof, are upright rails B, Fig. 7, and at this point I would have it understood that when a section is added to the tower to increase the height thereof, sections will be added to the rails B to correspondingly increase the height of the same. The rails B are designed to coöperate with and guide a skip C,

the office of which is to hoist plastic material to a desired point in the height of the tower and there dump the same. The skip C and the means for raising and tripping the same are preferably, though not necessarily, of the type disclosed in the Letters-Patent of one Wallace, No. 830,385 of September 4, 1906, and I have therefore deemed it sufficient to show the skip alone diagrammatically herein. I would also have it understood that when desired the skip may be dumped by a man stationed on the tower at the point where the skip is to be discharged of its contents, without affecting my invention.

Removably arranged in the tower and suitably supported, preferably by resting on one of the horizontal braces and by being hung from struts *i*, is a floor or platform D, and suitably supported above said platform D is a chute E adapted to receive plastic material from the skip C, and a hopper F arranged to receive plastic material from the chute, which hopper F is provided with a contracted discharge *k* and a gate *l* through the medium of which the before mentioned attendant can control the passage of plastic material from the hopper F. Arranged below and adapted to receive plastic material from the discharge of the hopper F is an open pan G to which is fixed a support H, Figs. 1 and 8. The said support H terminates at its lower end in a ball I which is disposed in a complementary socket J on the floor or platform D, and hence it will be manifest that the contracted discharge pipe G′ slipped in or on the reduced end of the pan G may be pointed in various directions according to the points on the building at which the plastic material is to be delivered to forms, as hereinafter described in detail. The said pipe G′, which extends outside the tower A and is preferably supported by wires m^3, Figs. 1 and 7, or other suitable means, is positioned to supply plastic material to an open pan K suitably connected with a conduit L, hereinafter described.

Fixed to the tower A at points adjacent the two forward corners thereof and extending throughout the height of the tower are Z-bars M, Figs. 3 and 7, so termed because of their shape in horizontal section. These bars M are designed for the engagement of Z-shaped hooks N on horizontal, vertically adjustable tracks P and R which are arranged one above the other and extend across the front side of the tower. Each track is adjustably fixed to the tower and against gravitation by the means best shown in Figs. 3, 3ª and 7—that is to say, through the medium of cast iron blocks S riveted to its hooks N and having notches T, and locking pieces U detachably connected to the corner uprights *a* of the tower, and having lugs V which occupy the said notches T. From this it follows that each track may be fixed to the tower at various points in the height thereof, and in this connection I would have it understood that any suitable means may be employed to raise and lower either track P or R such, for instance, as a cable (not shown) connected to the track and passed through a pulley block (also not shown) fastened at or near the top of the tower. Each of the tracks P and R is equipped with a boom-carriage W, best shown in Fig. 4, having an eye *m*, and antifriction balls *n* for easing the movement of the carriage, and each boom-carriage is provided with end sockets to receive eye-bolts *p*, connected by chains *r* with eye-bolts *s* which, in turn, are connected to opposite sides of the tower, this with a view of retaining the boom-carriage at one end or the other of its respective track. It will be understood here that each track has end plates m^4 or other stops to limit movement of its boom-carriage and that the eye-bolts *p* are turned through openings in said end plates m^4 and into the threaded sockets in their respective carriage.

X is the plastic-material boom of the apparatus—*i. e.*, the boom which carries conduit L, and Y is the construction-boom—*i. e.*, the boom having to do with the placing of forms, reinforcing-metal work, etc. on the building that is being constructed; the boom X being connected with the eye *m* of carriage W in the track P, and the boom Y being connected with the eye *m* of the carriage W in the track R. The boom X is preferably shaped in cross-section as shown in Fig. 14 and is designed to extend downwardly from the tower at about the angle shown in Fig. 1. Fixed to the inner end of the boom X, preferably in the manner shown in Fig. 2, and extending at an acute angle to said boom X, is an arm Z to which are connected cables A^2 A^2 through which the boom is maintained in position and moved as occasion demands; the cable A^2 being carried over a sheave A^4, and thence down to any suitable power or manual means A^5 for taking up or paying out the cable A^2.

As will be readily appreciated, the described arrangement of the arm Z, relative to the boom X, is materially advantageous inasmuch as it affords considerable leverage in the maintainence of the boom X in the position shown and in the raising and lowering of said boom.

The conduit L which extends through the boom X, Fig. 14, may be and preferably is formed in sections detachably connected by wires in the manner shown at the top of Fig. 9 or in any other approved manner, and obviously said conduit may be of any desired length to extend to any point in the length of the boom or beyond the outer end of the boom. The outermost section l^5 of

the conduit L is made to depend from the boom and is connected in the swiveled manner shown in Figs. 1 and 11, with a pipe section L^3 which latter is designed to discharge into a pipe B^3 for conveying the plastic material to a form or the like; the said pipe B^3 being open for a portion of its length, as shown, so as to enable an attendant to readily clear it when necessary and in that way prevent choking of the conduit L.

When deemed expedient or desirable, the pipe section B^4 of Figs. 9 and 10 may be used in lieu of the pipe sections L^3 and B^3; the said section B^4 being connected in a swiveled manner to the outermost section l^3 of conduit L, and being of a greater size in cross-section for a portion of its length than the same, this latter in order to lessen the liability of the conduit L becoming choked.

The before described pan K is arranged on and connected by wires f^3 or other suitable means to the boom L in position to receive from the pipe G', and the reduced end of said pan K is suitably connected with and arranged to discharge into the conduit L, Fig. 7.

The construction boom Y is maintained in the position shown by a guy cable C^3 extending between its outer end and the tower A, and is toothed at its underside, as indicated by c^3. On said boom Y is arranged a traveler D^3 which carries a pulley block E^3 and a dog lever F^3, the latter having a comparatively heavy arm f^3 adapted to engage the teeth c^3 and also having its other arm connected to a cable G^3 which extends to the ground. It will be manifest from the foregoing that an attendant standing on the ground is enabled through the cable G^3 to move the traveler D^3 outwardly on the boom Y; also, that when the cable G^3 is relieved of pull the arm f^3 of lever F^3 will fall away from the teeth of the boom, this latter in order to permit of the traveler being drawn inwardly on the boom after a load has been raised through the medium of a cable H^3 which extends through the pulley block E^3 and another pulley block I^3 and is designed to be taken up and paid out by suitable power or hand means J^3.

It will be gathered from the foregoing that when the carriages of the booms X and Y are held at one corner of the tower the booms can be oscillated to encircle three-fourths of a building, and then by shifting the boom carriages to the other corner of the tower and there fastening the same, the booms may be moved to reach to the other one-fourth of the building. It will also be manifest that as a building is raised the booms and the appurtenances can be raised, and when the apparatus is in use the only manual labor necessary to the successful operation thereof is one man on the platform D, one man to manipulate the lines of the booms, and three men to supply and set materials and tamp walls, etc.

As before stated, the construction herein shown and described constitutes the best practical embodiment of my invention of which I am aware, but it is obvious that in the future practice of my invention various changes in the form, construction and relative arrangement of parts may be made within the scope of my invention as defined in the claims appended.

Having described my invention, what I claim and desire to secure by Letters-Patent, is:

1. An apparatus for the purpose described, comprising a tower, a suitably-supported horizontally movable boom connected therewith, a conduit carried by the boom, means for raising plastic material to a suitable point in the height of the tower, and means for receiving plastic material from said raising means and conducting the same to said conduit.

2. An apparatus for the purpose described, comprising a tower, a suitably-supported oscillatory boom connected therewith, a conduit carried by the boom, means for raising plastic material to a suitable point in the height of the tower, and means for receiving plastic material from said raising means and conducting the same to said conduit.

3. An apparatus for the purpose described comprising a tower, a boom connected at its inner end with the tower and having an arm fixed with respect to and extending upwardly and outwardly at an acute angle from its inner portion; said boom and its arm being movable together as one piece, and means connecting the outer portion of the arm and the portion of the tower above the boom.

4. An apparatus for the purpose described comprising a tower, a boom connected at its inner end with the tower and having an arm extending upwardly and outwardly at an acute angle from its inner portion, means connecting the outer portion of the arm and the portion of the tower above the boom, a conduit carried by the boom, means for raising plastic material to a suitable point in the height of the tower, and means for receiving plastic material from said raising means and conducting the same to said conduit.

5. An apparatus for the purpose described, comprising a tower, a conduit extending laterally therefrom, a suitably-supported, horizontally-movable boom carrying the conduit; said boom being adjustably connected with the tower and adapted to be arranged at various points in the height thereof, means for raising plastic material to the point desired in the height of the con-

duit, and means for receiving plastic material from the raising means and conducting same to the conduit; the said receiving and conducting means being adjustable in the direction of the height of the tower.

6. An apparatus for the purpose described, comprising a tower, a track thereon, a carriage movable on the track and across the tower, a suitably supported boom connected with said carriage, a conduit carried by said boom, means for raising plastic material to a desired point in the height of the tower, and means for receiving plastic material from the raising means and conducting said material to the conduit.

7. An apparatus for the purpose described, comprising a tower, a track connected with and extending across the tower, a carriage on the track, and a suitably supported boom connected and movable with the carriage.

8. An apparatus for the purpose described, comprising a tower, a track connected with and extending across the tower, a carriage on the track, a suitably supported boom connected and movable with the carriage, and means for detachably fastening the carriage at opposite ends of the track.

9. In an apparatus for the purpose described, the combination of a tower having upright bars of angular form in cross-section, a track resting in front of the bars and having angular hooks engaged with and movable vertically on the bars and also having means on the hooks adapted to cooperate with means on the tower for adjustably fixing the hooks in position, the said means on the tower, and a carriage on the track.

10. In an apparatus for the purpose described, the combination of a tower having upright bars of angular form in cross-section, a track resting in front of the bars and having angular hooks engaged with and movable vertically on the bars and also having notched blocks on the hooks, movable means on the tower adapted to coöperate with said blocks, and a carriage on the track.

11. In an apparatus for the purpose described, the combination of a tower, means for raising plastic material to a suitable height thereof, tracks arranged one above the other on the tower and adapted to be moved, a carriage movable on one track, a construction boom connected with said carriage, a carriage movable on the other track, a boom connected with the latter carriage, a conduit carried by said means, and means for receiving plastic material from the raising means and conducting the same to the conduit of the boom.

12. The combination of a boom toothed at its underside, a traveler arranged on the boom and depending therefrom, a lever dog carried by the depending portion of the traveler and having a comparatively heavy arm adapted to engage the teeth of the boom, and depending means connected with the other arm of the lever dog.

13. In an apparatus for the purpose set forth, the combination of a tower, a boom connected therewith, a conduit carried by the boom, means for raising plastic material to a suitable point in the height of the tower and above the inner end of the conduit, and means for receiving plastic material from said raising means and chuting the same to the conduit.

14. In an apparatus for the purpose set forth, the combination of a tower, a boom connected therewith, a conduit carried by the boom, means for raising plastic material to a suitable point in the height of the tower and above the inner end of the conduit, and means for receiving plastic material from said raising means and chuting the same to the conduit; said means comprising a pan and a movable support therefor.

15. In an apparatus for the purpose set forth, the combination of a tower, a boom connected therewith, a conduit carried by the boom, means for raising plastic material to a suitable point in the height of the tower and above the inner end of the conduit, and means for receiving plastic material from said raising means and chuting the same to the conduit; said means comprising a pan movably supported in the tower, a conduit connected therewith, and a pan on the boom and connected with the conduit carried thereby and arranged to receive material from the conduit on the first named pan.

16. An apparatus for the purpose described comprising a tower, a boom connected at its inner end with the tower and having an arm fixed with respect to and extending upwardly and downwardly at an acute angle from its inner portion; said boom and its arm being movable together as one piece, means connecting the outer portion of the arm and the portion of the tower above the boom, means on the tower for elevating plastic material to a point above the plane of the work to be performed, a hopper adapted to receive the material so elevated and mounted on the tower, and a distributing conduit carried by and revoluble with the boom and arranged beneath and adapted to receive material from the hopper.

In testimony whereof I have hereunto set my hand in presence of two subscribing witnesses.

LEE CALLAHAN.

Witnesses:
W. I. WARNER,
W. E. BARTLETT.

more than one hundred miles from the place where the cause is to be tried, and with the consent of attending counsel.

I further certify that I am not of counsel or attorney to either of the parties, nor am I interested in the event of the cause.

I further certify that the fee for taking said depositions ($62) has been paid to me by defendants, and that the same is just and reasonable.

Witness my hand, and official seal at San Francisco, California, this third day of February, A. D. 1922.

Eugene P. Jones, Notary Public, Acting as Special Examiner Herein. (Seal.)

(Here follows Plaintiffs' Exhibit N, marked side folio pages 127-138, inclusive.)

[fol. 139] DEFENDANTS' EXHIBIT 36

United States of America,
Department of the Interior,
United States Patent Office.

To all to whom these presents shall come, Greeting:

This is to certify that the annexed is a true copy from the Records of this Office of Amendment to Preliminary Statement, forming part of Paper 10, filed September 1, 1909, in the matter of Interference Number 30,533, Smith v. Emtman v. Callahan, Subject-Matter: Material Transferring Accounts.

In testimony whereof I have hereunto set my hand and caused the seal of the Patent Office to be affixed in the District of Columbia this 19th day of January, in the year of our Lord one thousand nine hundred and twenty-one and of the Independence of the United States of America the one hundred and forty-fifth.

L. B. Mann, Acting Commissioner of Patents. (Seal.)

[fol. 140] IN THE UNITED STATES PATENT OFFICE

Before the Examiner of Interferences

St. Louis, August 30, 1909.

In re Interference No. 30,533 A

CALLAHAN

v.

EMTMAN

v.

SMITH

AMENDMENT TO PRELIMINARY STATEMENT

Now, this day, before the taking of testimony and immediately upon the receipt of the requirement of the Examiner of Interferences, dated August 27, 1909, comes Arthur L. Smith, a party hereto, and amends his preliminary statement by interlineation as follows:

Page 2, line 6, after the words "that the same was completed" insert the words "during the month of September, 1906,".

Page 2, line 7, after the words "successful operation" insert "during the month of September, 1906,".

Arthur L. Smith, by Hopkins & Eicks, His Attorneys.

STATE OF MISSOURI,
City of St. Louis, ss:

James L. Hopkins, of lawful age, being on his oath sworn, deposes and says that the facts contained in the foregoing amendment are true; that he is a member of the firm of Hopkins & Eicks, attorneys for Arthur L. Smith herein; that the above and foregoing amendment to the preliminary statement of Arthur L. Smith has been prepared by him from information given to him by said Arthur L. [fol. 141] Smith, which information was imparted to affiant by said Smith prior to the departure of said Smith from the United States.

That the said Arthur L. Smith is an engineer in the employ of the War Department of the United States; that in pursuance of his duty he left the United States after signing his preliminary statement, on or before the 5th day of August, 1909, for Corregidor Island, Philippine Islands.

That affiant makes this affidavit and the foregoing amendment on account of the absence of his client from the United States and the impossibility of securing the affidavit of the said Arthur L. Smith in the regular course of the mails in time to comply with the order allowing said Arthur L. Smith until September 13th, 1909, to file an amendment to the statement herein.

And Affiant further states that upon inquiry of the Postal authorities of the United States in the City of St. Louis, Missouri, he is advised that the average course of the mails between St. Louis, Missouri, and Corregidor Island, Philippines, is one month; dependent, of course, upon the sailing dates of steamers carrying mails from the Pacific Coast ports.

And further affiant saith not.

James L. Hopkins.

Subscribed and sworn to before me this 30th day of August, 1909. Walter C. Stein, Notary Public. My commission expires November 22, 1910. (Seal.)

[fol. 142] 30533-2

IN THE UNITED STATES PATENT OFFICE

Interference No. 30533 A

ARTHUR L. SMITH

v.

THEODORE EMTMAN

v.

LEE CALLAHAN

Subject-matter: Devices for Distributing Concrete

Statement of Smith filed July 30, 1919; examined Aug. 27, 1909; Approved —— —, 190-.

PRELIMINARY STATEMENT OF ARTHUR L. SMITH

CITY OF ST. LOUIS,
State of Missouri, ss:

Arthur L. Smith, of the City of Washington in the District of Columbia, late of the City of St. Louis, State of Missouri, being upon his oath duly sworn, deposes and says:

That he is the same Arthur L. Smith who is named as a party to the above-entitled interference, in which his application for patent for Improvements in Devices for Distributing Concrete, Serial No. 479,479, filed February 23, 1909, has been adjudged to be in interference with the applications for patents of Theodore Emtman and Lee Callahan.

That he conceived the invention set forth in the declaration of interference in the month of July, 1906; that afterwards, and in the month of July, 1906, he made several sketches of a device for the

practice of his said invention, and has subsequently made other sketches thereof and explained them to others; that he first made drawings of the invention at issue in or about the month of July of the year 1906; that, aside from the actual reduction to practice of his invention, as hereinafter set forth, he has never made a model thereof; that in or about the month of July, 1906, he first disclosed [fols. 143 & 144] and explained the invention to others; that he reduced his said invention to practice by the actual erection and construction of a machine embodying his invention at the City of Norfolk, Norfolk County, Virginia, beginning the construction thereof in the month of August, 1906, and that the same was completed and put into successful operation at said place and continued for about two months in use and operation in and about the erection of the Lynnhaven Hotel at the corner of Granby and Freemason Streets in the said City of Norfolk; that the said invention has been used in the construction of the Lynnhaven Hotel at Norfolk, Virginia, as last above set forth, and was subsequently used in the month of June, 1907, in the said City of Norfolk, Virginia, in the construction of the Vinery Building in said City of Norfolk, comprising stores and apartments, and subsequently during the year 1908, the said invention was employed by this affiant in the erection of the St. Louis Coliseum in the City of St. Louis, Missouri; that said invention was used throughout the entire construction of the walls of each of the edifices referred to, and that the building contracts in the course of which the said invention was so used amounted to an aggregate of about $560,000; the contract for the Vinery Building being in the sum of $60,000; that of the Lynnhaven Hotel being in the sum of $200,000, and that of the St. Louis Colliseum being in the sum of $300,000.

And further affiant saith not.

Arthur L. Smith.

Subscribed and sworn to before me this 28th day of July, 1909. Walter C. Stein, Notary Public. My commission expires November 22, 1910. (Seal.)

(Here follow Defendants' Exhibits 38 and 39, marked side folio pages 145-148, inclusive.)

[fol. 149] DEFENDANTS' EXHIBIT 63

United States of America,
Department of the Interior,
United States Patent Office.

To all to whom these presents shall come, Greeting:

This is to certify that the annexed is a true copy from the Records of this Office of the Preliminary Statement of Arthur L. Smith, filed July 30, 1919, in the matter of Interference Number 30,533, Smith v. Emtman v. Callahan, Subject Matter: Devices for distributing concrete.

BLUEPRINT
TOO
LARGE
FOR
FILMING



In testimony whereof I have hereunto set my hand and caused the seal of the Patent Office to be affixed at Washington in the District of Columbia, this 7th day of August, in the year of our Lord one thousand nine hundred and twenty and of the Independence of the United States of America the one hundred and forty-fifth.

M. H. Coulston, Acting Commissioner of Patents. (Seal.)

[fol. 150] IN THE UNITED STATES PATENT OFFICE

Interference No. 30533 A

ARTHUR L. SMITH

v.

THEODORE EMTMAN

v.

LEE CALLAHAN

Subject-matter: Devices for Distributing Concrete

Statement of Smith filed July 30, 1909; Examined Aug. 27, 1909; approved —— —, 190-.

PRELIMINARY STATEMENT OF ARTHUR L. SMITH

CITY OF ST. LOUIS,
State of Missouri, ss:

Arthur L. Smith, of the City of Washington in the District of Columbia, late of the City of St. Louis, State of Missouri, being upon his oath duly sworn, deposes and says:

That he is the same Arthur L. Smith who is named as a party to the above-entitled interference, in which his application for patent for Improvements in Devices for Distributing Concrete, Serial No. 479,479, filed February 23, 1909, has been adjudged to be in interference with the applications for patents of Theodore Emtman and Lee Callahan.

That he conceived the invention set forth in the declaration of interference in the month of July, 1906; that afterwards, and in the month of July, 1906, he made several sketches of a device for the practice of his said invention, and has subsequently made other sketches thereof and explained them to others; that he first made drawings of the invention at issue in or about the month of July of the year 1906; that, aside from the actual reduction to practice of his invention, as hereinafter set forth, he has never made a model thereof; that in or about the month of July, 1906, he first disclosed and explained the invention to others; that he reduced his said in-
[fol. 151] vention to practice by the actual erection and construction of a machine embodying his invention at the City of Norfolk, Norfolk County, Virginia, beginning the construction thereof in

the month of August, 1906, and that the same was completed and put into successful operation at said place and continued for about two months in use and operation in and about the erection of the Lynnhaven Hotel at the corner of Granby and Freemason Streets in the said City of Norfolk; that the said invention has been used in the construction of the Lynnhaven Hotel at Norfolk, Virginia, as last above set forth, and was subsequently used in the month of June, 1907, in the said City of Norfolk, Virginia, in the construction of the Vinery Building in said City of Norfolk, comprising stores and apartments, and subsequently during the year 1908, the said invention was employed by this affiant in the erection of the St. Louis Coliseum in the City of St. Louis, Missouri; that said invention was used throughout the entire construction of the walls of each of the edifices referred to, and that the building contracts in the the course of which the said invention was so used amounted to an aggregate of about $560,000; the contract for the Vinery Building being in the sum of $60,000; that of the Lynnhaven Hotel being in the sum of $200,000, and that of the St. Louis Coliseum being in the sum of $300,000.

And further affiant saith not.

Arthur L. Smith.

Subscribed and sworn to before me this 28th day of July, 1909. Walter C. Stein, Notary Public. My commission expires November 22, 1910. (Seal.)

[fol. 152] UNITED STATES OF AMERICA

Department of the Interior,
United States Patent Office.

To all to whom these presents shall come, Greeting:

This is to certify that the annexed is a true copy from the Records of this office of the Preliminary Statement of Lee Callahan, filed August 13, 1909, in the matter of Interference Number 30,533, Smith vs. Emtman vs. Callahan. Subject-matter: Material Transferring Apparatus.

In testimony whereof I have hereunto set my hand and caused the seal of the Patent Office to be affixed at Washington in the District of Columbia, this 7th day of August, in the year of our Lord one thousand nine hundred and twenty and of the Independence of the United States of America the one hundred and forty-fifth.

M. H. Coulston, Acting Commissioner of Patents. (Seal.)

[fol. 153] IN THE UNITED STATES PATENT OFFICE

Interference No. 30,533 A

LEE CALLAHAN

vs.

THEODORE EMTMAN

vs.

ARTHUR L. SMITH

Statement of Callahan filed August 13, 1909; examined August 27, 1909; approved —— —, 190-.

PRELIMINARY STATEMENT OF LEE CALLAHAN

Lee Callahan, of San Diego, in the County of San Diego, and State of California, being duly sworn, doth depose and say that he is a party to the interference declared by the Commissioner of Patents July 13, 1909 between his application for Letters-Patent, filed January 21, 1909, serial number 473,461, and the application of Theodore Emtman, and also the application of Arthur L. Smith, for a patent on Material Transferring Apparatus; that he conceived the invention set forth in the declaration of interference on or about the 15th of July, 1907; that from time to time, beginning with the conception of the invention, he made sketches and drawings, and made a full size working drawing on or about November 5, 1908; that he first explained the invention to others on or about August 15, 1907; that he made a model of the invention on or about July 15, 1907, and that he made various other models between July 15th and 18th, 1907; that he made a full and complete apparatus beginning with the 18th of September, 1908 and completed the same on the 11th of October, 1908; that inasmuch as the apparatus was then complete and successfully operated he considers that he reduced his invention to actual practice not later than October 11, 1908; that [fol. 154] the invention has been successfully used in the erection of structures in various places, and particularly at Colton, California, San Bernardino, California, Pasadena, California, San Jose, California, and Los Angeles, California, and that the invention is being successfully used at present.

Lee Callahan.

Subscribed to and sworn before me this 9th day of August, 1909. C. T. Hirst, Notary Public. My commission expires May 21, 1910. (Seal.)

30533—6

IN THE UNITED STATES PATENT OFFICE

Interference 30533

THEODORE EMTMAN

v.

ARTHUR L. SMITH

v.

LEE CALLAHAN

Subject-matter Concrete Construction

Statement of Emtman filed August 16, 1909; Examined August 27, 1909; Approved —— —, 190-.

PRELIMINARY STATEMENT OF THEODORE EMTMAN

STATE OF CALIFORNIA,
County of Los Angeles, ss:

Theodore Emtman, of Los Angeles, County of Los Angeles, State of California, being duly sworn, deposes and says: That he is a party [fol. 155] to the Interference No. 30533 declared by the Commissioner of Patents July 13, 1909, and between said Emtman's application for Letters Patent filed February 17th, 1909, serial No. 478520, and an application of Arthur L. Smith, of St. Louis, Missouri, and an application of Lee Callahan, of San Diego, California; that deponent conceived the invention set forth in the said declaration of interference during the month of June, 1906; that he made a sketch of the invention during the month of October, 1906; that he first explained the invention to others during the month of December, 1906, and again in October, 1907; that he commenced the construction of his invention in a full sized apparatus during the month of November, 1907, and completed it in about the latter part of December, 1907; and that the said apparatus was first successfully operated during the latter part of December, 1907; or early part of January 1908, in Los Angeles, California; that he has since continued to use the same and that since then he has manufactured seven other similar apparatus, and that no application for patent on the said invention has been made in any country foreign to the United States.

Theodore Emtman.

Subscribed and sworn to before me this 31st day of July, 1909. James Gysin, Notary Public in and for Los Angeles County, State of California.

[fol. 156] 30,618—4

IN THE UNITED STATES PATENT OFFICE

Interference 30,618

THEODORE EMTMAN

vs.

LEE CALLAHAN

Subject-matter: Concrete Construction

Statement of Emtman filed August 16, 1909; Examined August 27, 1909; Approved —— —, 190-.

PRELIMINARY STATEMENT OF THEODORE EMTMAN

STATE OF CALIFORNIA,
County of Los Angeles, ss:

Theodore Emtman, of Los Angeles, County of Los Angeles, State of California, being duly sworn, deposes and says; that he is a party to the interference No. 30618, declared by the Commissioner of Patents July 13, 1909; and between said Emtman's application for letters patent filed February 17th, 1909, serial number 478520, and an application of Lee Callahan, of San Diego, California; that deponent conceived the invention set forth in the said declaration of interference during the month of June, 1906; that he made a sketch of the invention during the month of October, 1906; that he first explained the invention to others during the month of December, 1906, and again in October, 1907; that he commenced the construction of his invention in a full sized apparatus during the month of November, 1907, and completed it in about the latter part of December, 1907; and that the said apparatus was first successfully operated during the latter part of December, 1907; or early part of January, 1908, in Los Angeles, California; that he has since con-
[fol. 157] tinued to use the same and that since then he has manufactured seven other similar apparatus, and that no application for patent on the said invention has been made in any country foreign to the United States.

Theodore Emtman.

Subscribed and sworn to before me this 31st day of July, 1909. James Gysin, Notary Public in and for Los Angeles County, State of California.

United States of America,
Department of the Interior,
United States Patent Office.

To all to whom these presents shall come, Greeting:

This is to certify that the annexed is a true copy from the Records of this Office of the Preliminary Statement of Lee Callahan, filed August 13, 1919, in the matter of Interference Number 30,618, Emtman vs. Callahan, Subject-matter: Material Transferring Apparatus.

In testimony whereof I have hereunto set my hand and caused the seal of the Patent Office to be affixed at Washington in the District of Columbia, this 17th day of August in the year of our Lord one thousand nine hundred and twenty and of the Independence of the United States of America the one hundred and forty-fifth.

M. H. Coulston, Acting Commissioner of Patents. (Seal.)

[fol. 158] 30618—2

IN THE UNITED STATES PATENT OFFICE

Interference No. 30,618 A

LEE CALLAHAN

vs.

THEODORE EMTMAN

Statement of Callahan filed August 13, 1919; examined August 27, 1909; Approved —— —, 190-.

PRELIMINARY STATEMENT OF LEE CALLAHAN

Lee Callahan of San Diego, in the County of San Diego, and State of California, being duly sworn, doth depose and say that he is a party to the interference declared by the Commissioner of Patents July 13, 1909, between his application for Letters-Patent, filed January 21, 1909, serial No. 473,461, and the application of Theodore Emtman, for a patent on Material Transferring Apparatus; that he conceived the invention set forth in the declaration of interference on or about the 15th of July, 1907; that from time to time beginning with the conception of the invention he made sketches and drawings and made a full size working drawing on or about November 5, 1908; that he first explained the invention to others on or about August 15, 1908; that he made a model of the invention on or about July 15th, 1907, and that he made various other models between July 15th, and 18th, 1907; that he made a full and complete apparatus beginning with the 18th of September, 1908 and completing the same on the 11th of October, 1908; that inasmuch as

DEFENDANTS' EXHIBIT 67.

SMITH PATENT 948,746.

162-163

A. L. SMITH.

DEVICE FOR DISTRIBUTING CONCRETE.

APPLICATION FILED FEB. 23, 1909.

948,746.

Patented Feb. 8, 1910.

3 SHEETS—SHEET 1.

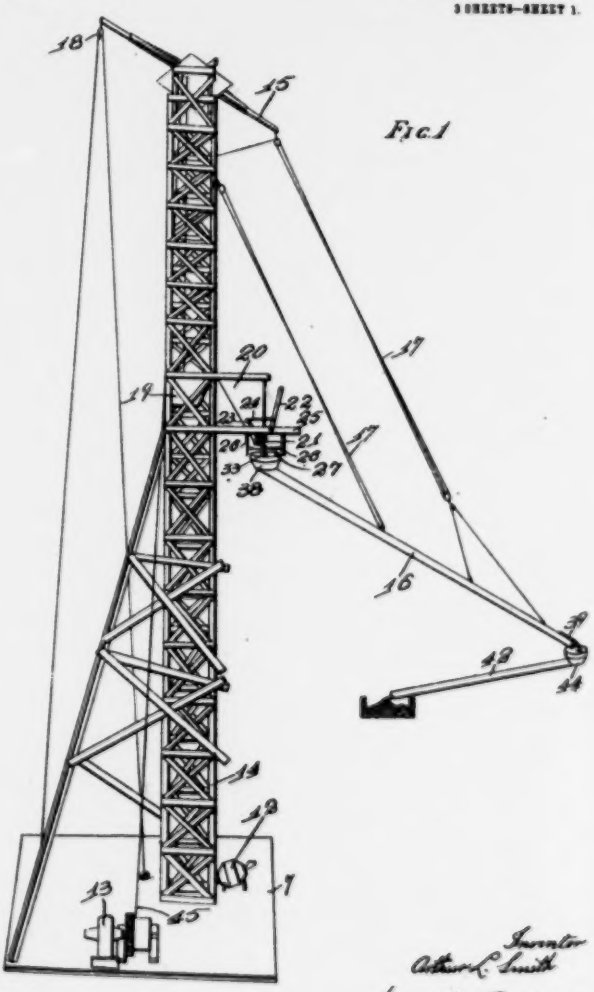


Fig. 1

Witnesses
H. B. Stevens
E. C. Goldthwaite

Inventor
Arthur L. Smith
by Hopkins & Eaton Attys

164–165

A. L. SMITH.

DEVICE FOR DISTRIBUTING CONCRETE.

APPLICATION FILED FEB. 23, 1909.

948,746.

Patented Feb. 8, 1910.

2 SHEETS—SHEET 2.

Fig. 2

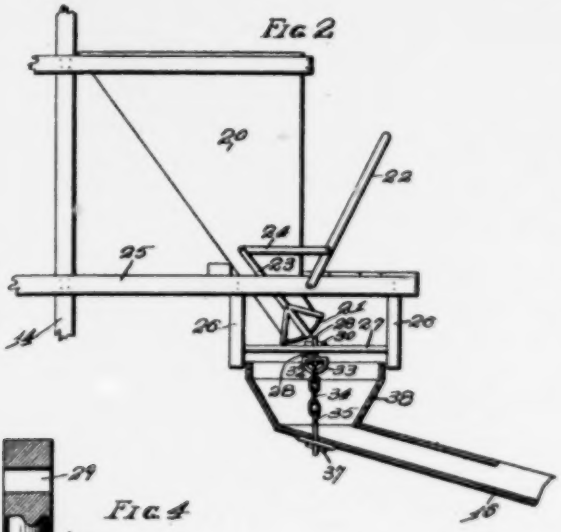


Fig. 4

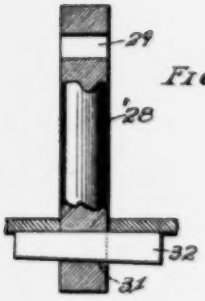
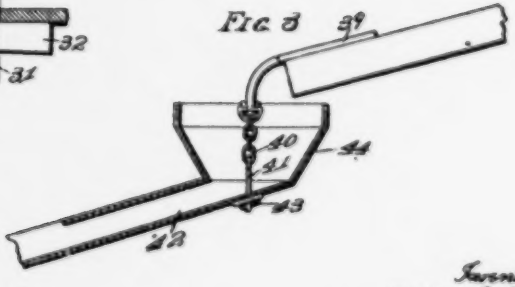


Fig. 3



Witnesses
W. B. Stiles
L. A. Coffin Jr.

Inventor
Arthur L. Smith
by Robertson & Eccles attys

166

A. L. SMITH.

DEVICE FOR DISTRIBUTING CONCRETE.

APPLICATION FILED FEB. 23, 1909.

948,746.

Patented Feb. 8, 1910.

3 SHEETS—SHEET 3.

Fig. 5

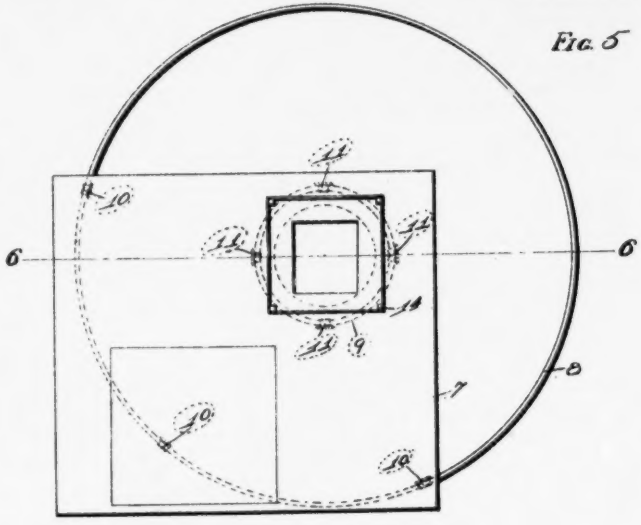
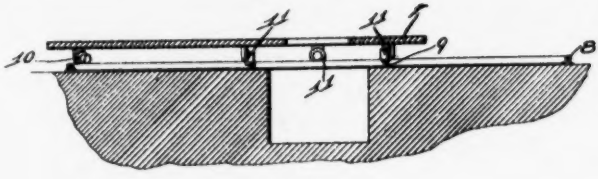


Fig. 6



Witnesses
H. B. Stein
L. A. McIntyre

Inventor
Arthur L. Smith
by Hopkins & Ericks Attys

UNITED STATES PATENT OFFICE.

ARTHUR L. SMITH, OF ST. LOUIS, MISSOURI, ASSIGNOR, BY MESNE ASSIGNMENTS, TO CONCRETE APPLIANCES COMPANY, OF ST. LOUIS, MISSOURI, A CORPORATION OF MISSOURI.

DEVICE FOR DISTRIBUTING CONCRETE.

948,746. Specification of Letters Patent. Patented Feb. 8, 1910.

Application filed February 23, 1909. Serial No. 479,479.

To all whom it may concern:

Be it known that I, ARTHUR L. SMITH, a citizen of the United States, and resident of St. Louis, Missouri, have invented certain new and useful Improvements in Devices for Distributing Concrete, of which the following is a specification.

My invention relates to an improved device for distributing concrete, and has for its object to provide means whereby concrete, during the process of concrete building construction, is distributed from a single source to many different points of deposit.

In the drawings—Figure 1 is a perspective view of a device embodying my invention. Fig. 2 is an enlarged side plan view of the distributing hopper employed in my invention and its connections. Fig. 3 is a side plan view of the lower end of the first distributing pipe employed in my invention, showing its mode of adjustment to the second distributing pipe. Fig. 4 is an enlarged plan view of the pin employed as a fastener in suspending the upper end of the first distributing pipe; showing the upper and lower ends of said pin in section. Fig. 5 is a top plan view of the turntable and track employed in my invention. Fig. 6 is a transverse vertical view in section of the same taken along the line 6—6 of Fig. 5.

As illustrated in the drawings, the device of my invention employs a platform 7 rotatably mounted upon the track 8 and inner concentric track 9 by means of the wheels 10 and 11. Upon the platform 7 the concrete mixer 12 and the motor 13 are mounted; the platform 7 carrying the derrick 14. The derrick 14 is provided with the boom 15 at its top, said derrick and boom serving to suspend the first distributing pipe 16 by means of suitable block-and-tackle connections indicated in the drawings by the numeral 17; the position of the boom 15 being controlled by the block 18 and its connections.

The concrete mixed in the mixer 12 is conveyed in a bucket 19 elevated by means of the rope 45 to the point where the hopper 20 is mounted upon the derrick 14. The bottom of the hopper is provided with the closure 21 operated by the lever 22 through the connecting members 23 and 24; the lever 22 being pivotally mounted on the beam 25. From the beam 25 the suspending members 26—26 extend to a point beneath the mouth of the hopper 20 and carry the cross bar 27 which is perforated to admit the upper end of the pin 28. The pin 28 is provided with the slot 29 which is adapted to receive the key 30; the object of this construction being to avoid the use of a bolt and nut, the action of the concrete in time rendering it impossible to remove the nut from the bolt. The lower end of the pin 28 is provided with a slot 31 to receive the key 32 by means of which the yoke 33 is retained in position. The chain 34 serves to hold the pin 35 which passes through the lower wall of the distributing pipe 16 and is secured in place by means of the key 37 passing through the slot in its lower end. The pipe 16 is provided with a hopper 38 at its upper end, and at its lower end is provided with the arm 39 supporting a chain 40, by which the pin 41 is supported, the pin 41 passing through the bottom of the second distributing pipe 42 and being secured in place by a key 43. The pipe 42 is provided at its upper end with the hopper 44. It will thus be seen that the lower distributing pipe 42 is so suspended with reference to the mouth of the upper distributing pipe 16 that it can be revolved throughout a radius of 360°; while the upper distributing pipe 16 may be similarly revolved with reference to the bottom of the hopper 20.

In the use of my invention, the tracks 8 and 9 are laid as nearly as practicable at the center of the building to be erected. The concrete is then mixed, elevated and distributed through the pipes 16 and 42 to the various forms or molds to be filled; the hopper 20 being carried by the derrick 14 at a point above the plane of the highest point to which concrete is to be distributed. The rate of flow of the concrete from the hopper 20 to the point of distribution is governed by the consistency of the concrete and the angles at which the pipes 16 and 42 are respectively mounted.

When desired, a third or any desired number of additional distribution pipes may be added, the first of the pipes so added being suspended from the mouth of the pipe 42 and the others added to connect therewith in their order. But I have found in practice that the structure shown with but two distributing pipes is operative on a scale sufficiently large for the construction of buildings of any usual size.

Having fully described my invention, what I claim as new and desire to have secured to me by the grant of Letters Patent, is:

1. In a device for distributing concrete, means for elevating the concrete to a point above the plane of the work to be performed; a hopper adapted to receive the concrete so elevated; a primary distributing pipe revolubly mounted beneath the hopper; and a secondary distributing pipe revolubly mounted beneath the mouth of the first-named distributing pipe, substantially as described.

2. In a device for distributing concrete, means for elevating the concrete to a point above the plane of the work to be performed; a hopper adapted to receive the concrete so elevated; a primary distributing pipe revolubly mounted beneath the hopper; a secondary distributing pipe revolubly mounted beneath the mouth of the first-named distributing pipe, and means for controlling the flow of concrete from the hopper to the first-named distributing pipe, substantially as described.

3. In a device for distributing concrete, a concrete elevator; a revolubly mounted distributing pipe adapted to be fed by said elevator; a second distributing pipe revolubly mounted at the mouth of the first-named distributing pipe, and means for controlling the angle at which said distributing pipes are mounted, substantially as described.

4. A plant for concrete construction comprising an elevator provided with means for receiving and raising concrete, a chute adapted to receive the concrete raised by the elevator and to deliver the same by gravity, said chute being inclined and being movable horizontally to shift the point of delivery of the concrete, the lower end of said chute being provided with a horizontally rotatable delivery pipe.

In testimony whereof, I have signed my name to this specification, in presence of two subscribing witnesses.

ARTHUR L. SMITH.

Witnesses:
WALTER C. STEIN,
L. A. L. MCINTYRE.

DEFENDANTS' EXHIBIT 68.

CERTIFIED COPY OF SKELETON HISTORY OF EMTMAN PATENT 948,723.

UNITED STATES OF AMERICA.

DEPARTMENT OF THE INTERIOR.

UNITED STATES PATENT OFFICE.

To all to whom these presents shall come, Greeting:

THIS IS TO CERTIFY that the annexed is a true copy from the Records of this Office of the Original Claims, Papers 2 and 5, and the Face of the File Wrapper in the matter of the

Letters Patent of

Theodore Emtman, Assignor, by mesne assignments, to

Concrete Appliances Company,

Number 948,723, Granted February 8, 1910,

for

Improvement in Plants for Concrete Construction.

IN TESTIMONY WHEREOF I have hereunto set my hand and caused the seal of the Patent Office to be affixed in the District of Columbia this 26th day of October, in the year of our Lord one thousand nine hundred and twenty-one and of the Independence of the United States of America the one hundred and forty-sixth.

260

Acting Commissioner of Patents.

170

DIV. 4 (EXT'S BOOK) 203 308

1999

NUMBER (Series of 1900), 478520 PATENT No. 948723

Name Theodore Emtsman,
Assignor to L. O. Engstrom Company of
Los Angeles, Cal. a citizen of Cal.
[illegible] assignor to James A. Hopkins,
of St. Louis, Mo. and Francis A. Lyon, of Los
Angeles, California, [illegible]
of Los Angeles
County of Concrete Appliance Company, of St. Louis, Mo. a corp. of Mo.
State of California
Invention Plant for Concrete Construction

PARTS OF APPLICATION FILED.

	ORIGINAL	RENEWED
Petition	Feb 17, 1909	, 190
Affidavit	" 17, 1909	, 190
Specification	" 17, 1909	, 190
Drawing	" " , 1909	, 190
Model or Specimen	, 190	, 190
First Fee Cash	, 190	, 190
" " Cert $15	Feb 17, 1909	, 190
Appl. filed complete	" " , 190 "	, 190

Division of App., No. , Filed , 190

Examined B.W. Red E. Dec 17. 1909
Countersigned For Commissioner
Notice of Allowance Dec 24, 1909 For Commissioner
Final Fee Cash $20 - Jan 12, 1910
" " Cert , 190
Patented February 8, 1910
Associate Attorney Attorneys Glossbrenner, Lyon & Hackley,
Merchants Trust Bldg.
Los Angeles, Cal.

Name Emtsman T. Serial No. 478.520.
Patent No. Date of Patent

What I claim is:--

Cancelled per. B

1. A plant for concrete construction comprising an elevator provided with means for receiving and raising concrete, a chute adapted to receive the concrete raised by the elevator and to deliver the same by gravity, said chute being inclined and being movable horizontally to shift the point of delivery of the concrete.

2. A plant for concrete construction comprising an elevator provided with means for receiving and raising concrete, a chute adapted to receive the concrete raised by the elevator and to deliver the same by gravity, said chute being inclined and being movable vertically to shift the point of delivery of the concrete.

3. A plant for concrete construction comprising an elevator provided with means for receiving and raising concrete, a chute adapted to receive the concrete raised by the elevator and to deliver the same by gravity, said chute being inclined and being movable horizontally and vertically to shift the point of delivery of the concrete.

Cancelled per C

4. A plant for concrete construction comprising an elevator provided with means for receiving and raising concrete, a chute adapted to receive the concrete raised by the elevator and to deliver the same by gravity, said chute being inclined and being movable horizontally to shift the point of delivery of the concrete, the lower end of said chute being provided with a horizontally rotatable delivery pipe.

5. A plant for concrete construction comprising an elevator provided with means for receiving and raising concrete, a chute adapted to receive the concrete raised by the elevator and to deliver the same by gravity, said chute being mounted to rotate on a vertical axis.

6. A plant for concrete construction comprising an elevator provided with means for receiving and raising concrete, a chute adapted to receive the concrete raised by the elevator and to deliver the same by gravity, a mast mounted to rotate on a vertical axis, a chute pivoted to said mast and extending therefrom at an inclination to feed the concrete by gravity, and a boom supporting said chute and having extensible connections with the mast to vary its vertical position.

7. A plant for concrete construction comprising an elevator provided with means for receiving and raising concrete, a chute adapted to receive the concrete raised by the elevator and to deliver the same by gravity, a mast mounted to rotate on a vertical axis, a chute pivoted to said mast and extending therefrom at an inclination to feed the concrete by gravity, a boom supporting said chute and having extensible connections with the mast to vary its vertical position, and a delivery pipe swivelled to the lower end of said chute to turn it to different angular positions.

APK-F.

Cancelled Fer. B.

8. A plant for concrete construction comprising in combination with means for preparing, including mixing the various materials which are to form the concrete, an elevator provided with means for receiving and raising the concrete as prepared by said first means, a chute adapted to receive the concrete raised by said elevator and to deliver the same by gravity, said chute being inclined and being movable horizontally to shift the point of delivery of the concrete.

Amount of ↑

1.7.1.D. Chute Agreeable Leg L. & U. Trunks.

Div. 4 Room 232 MEP-Ba Paper No. 2

All communications should be addressed to "The Commissioner of Patents, Washington, D. C."

All communications respecting this application should give the serial number, date of filing, and title of invention.

DEPARTMENT OF THE INTERIOR,

UNITED STATES PATENT OFFICE,

WASHINGTON, D. C., May 8, 1909

Theodore Emtman,

c/o Townsend, Lyon and Hackley,

Los Angeles, Cal,

Please find below a communication from the EXAMINER in charge of your application.

Serial No. 478,520, filed February 17. 1909, for Plant for Concrete Construction.

E. B. Moore.

Commissioner of Patents.

Case examined.

The "bearing 21'" line 25, page 3, is not designated on the drawing.

Claims 1, 2, 3 and 5 are met by Dinsmore, 438,612, Oct. 21, 1890 (V.H. & D) considered jointly with Record, 667,335, Feb. 5, 1901 (Chutes) or Walsh, 560,382, May 19, 1896 (ib).

No invention is required to substitute a chute such as is shown by Record and Walsh, for the form of chute shown in Dinsmore.

Claim 4 is met by Dinsmore and Record, cited, in view of Gilson, 360,290, Mar. 29, 1887 (Spouts).

Where are the "extensible connections" referred to in claims 6 and 7?

All that claim 8 contains that is beyond a mere aggregation of devices is shown in the Record and Dinsmore patents.

Claims 1, 2, 3, 4, 5 and 8 are rejected on references above noted, while claims 6 and 7 are not clearly shown.

B.

B. W. Pond
200 &

175-176

Div. 4. Room. 232 MKP-Ba Paper No. 5

All communications should be addressed to "The Commissioner of Patents, Washington, D. C."

All communications respecting this application should give the serial number, date of filing, and title of invention.

DEPARTMENT OF THE INTERIOR,

UNITED STATES PATENT OFFICE,

WASHINGTON, D. June 14, 1909

Theodore Emtman,

c/o Townsend, Lyon and Hackley,

Los Angeles, Cal.

Please find below a communication from the ***EXAMINER*** *in charge of your application,*

Serial No. 478,520, filed February 17, 1909, for Plant for Concrete Construction.

E. B. Moore.

Commissioner of Patents.

Amended June 1, 1909:

An interference has been formulated between this application and two other pending applications filed by Smith and Callahan and a declaration of a second interference involving only the applications of Emtman and Callahan will be made as soon as some objections to both cases are removed by amendment. To that end, attention is again called to Office action of May 8, in this case, in which claims 1, 2, 3, 5 and 8 were rejected, and claims 6 and 7 were objected to. The claims named are again refused, and proper response should be made at once to this action.

B.

BWR

the apparatus was then complete and successfully operated he considers that he reduced the invention to actual practice not later than October 11, 1908; that the invention has been successfully used in [fol. 159 & 160] the erection of structures in various places, and particularly at Colton, California, San Bernardino, California, Passadena, California, San Jose, California, Los Angeles, California, and that the invention is being successfully used at present.

Lee Callahan.

Subscribed and sworn to before me this 9th day of August, 1909. C. T. Hirst, Notary Public. My comiss. expires May 21, 1920. (Seal.)

(Here follow Defendants' Exhibits 67 and 68, marked side folio pages 161-176, inclusive.)

[fol. 177] IN UNITED STATES DISTRICT COURT

OPINION SUR TRIAL HEARING ON BILL—Filed June 13, 1922

DICKINSON, J.:

This cause concerns Letters Patent 948,719, applied for January 21, 1909, and issued February 8, 1910, to Lee Callahan, for an apparatus for hoisting and distributing concrete.

One defence is the absence of invention. Whenever the patented thing is a construction the question often arises of whether it is the product of invention or merely of constructive skill. How near this border line the subject matter of this patent is its juridical experience shows. One Court before which the patent has been was not able to find invention; the other found it.

The patented thing with which we are now concerned is an appliance for use as an aid in large building operations. Given the thought of its use and the plan of its construction, all else may be done by the user. It is used in the building trade in operations of which concrete construction is a part. The cement must be brought to the place of the concrete construction in a condition in which it will "set." The first thought in the appliance is that of the utilization of the force of gravity. The cement is conveniently "mixed" on the ground. The concrete work may be placed far above it. When "mixed" must be lifted to a height. This varies. It must thence flow to the required place. This shifts. These needs suggest the features which such an appliance must possess. They may be listed by paraphrasing the language of Claim 5 (the most significant one in issue), enumerating its elements, although in a somewhat different order of statement and with additions. They are, [fol. 178] together with appropriate support fastenings, (1) a mast or tower to provide for a hoist; (2) a bucket, scuttle or skip in which to carry up the cement; (3) hoists to raise and lower the bucket;

(4) a hopper in which to deposit it for distribution; (5) a pipe, trough or other conduit to conduct its flow; (6) provision for the hopper and the high end of the conduit being maintained at adjustable heights; (7) provision for a swiveled or goose-necked attachment of the conduit to the tower so that the conduit would have freedom of movement of its discharging end both vertically and laterally; and (8) possibly a "boom" or other support for the conduit in addition to its attachment to the tower. Whether all these needs are obvious, and providing for them, calls only for ordinary constructive skill, determines the question of invention. As every element named had long been used in kindred arts and every one of them separately or in smaller groups in this art, it is manifest that invention could reside only in the novel thought of their use in combination. It is also evident that these needs and practicable provision to meet them would vary with the conditions under which the work was to be done as the means of depositing the cement must be adapted to these conditions. The owner of any appliance for doing what was thus required to be done might sell it to the user, having had it fabricated in parts, and assemble and erect it at the place of the operation, or he might license those in charge of the operation to make and erect it, thereby selling to them the naked thought of its use, together with plans for its construction and erection. Indeed, the latter was what the owner of this patent at first did, disguising the sale of the use of the mere idea by providing a superintendent of construction.

Early in the more general use of concrete construction what is called "dry cement" was favored. There was a pronounced prejudice [fol. 179] against the use of the more liquid form now accepted. It took time to overcome this prejudice. The introduction of "reinforced concrete," and the greater facility in handling cement when "wet" probably caused the preference for "dry" to be yielded and the prejudice against the "wet" to be abated. The increase in the volume of the cement used also of course contributed. This prejudice still lingers, and as long as it was general, the "gravity" method of distribution was little used. When the "wet" concrete came into general use and the operation was a large one, the "gravity" method was feasible and practically necessary. Some of the appliances were the veriest makeshifts. "Chutes" were in common use. They must of course be supported. Halyards; "horses;" "trestles;" "falsework;" "cross yards;" and all kinds of supports, including, as is claimed, even "booms," were used. The methods of handling the cement adopted, and the means employed, were suggested, if not dictated, by the conditions with which the builder was forced to cope. In such a state of the art to give a monopoly of any one method is fraught with danger of injustice. A builder might be obstructed in his choice of methods which were open to all, or he might find himself shut out from the use of one which had been in use. Indeed this is the very situation which is the basis of the defence now made. The defendants and other builders in sympathy with them resent as an injustice that they are charged for the use of a method of doing

concrete work which would be adopted by any one who had the work to do without any hint gathered from this patent. The practical importance to them and through them to the owners of buildings is attested by the fact that when the plaintiff charged merely for the use of the ideas behind his appliance the license fee de- [fol. 180] manded was on the basis of the concrete laid and was ten cents a yard. The charge now made for the constructed appliance is thirty-five hundred dollars ($3,500). If what is thus charged for is what any competent builder would do without the aid of any suggestions from the patentee the sum demanded is a tax. If on the other hand, however, the plaintiff's appliance is the product of patentable invention, the right to use it is the property of the patentee.

This brings us to face the question of invention. Right here the defendant is confronted with the ruling by the Circuit Court of Appeals for the Sixth Circuit, the supplementary opinion supporting which is reported in 262 Fed. Rep., 958.

How far is the question still an open one for a trial Court to determine? The res adjudicata doctrine of course does not apply because the present defendant was in no sense a party to that cause. At least some, however, of the very questions which now arise were determined in that case with all before that Court which is before us. One was the question of invention, and the other of novelty as affected by prior patents and previous publications only. There is, or at least there is claimed to be, evidence of the state of the prior art and of anticipation by prior use which was not then before the Court. A patent right is a property right in respect to which the validity of the grant is analagous to a good title to other property. The thought of a right in any one to property to which he has not a good title cannot be entertained. There is a contradiction in terms. So likewise there is no property right in any real sense in a patent which is of validity in one district or circuit and not in others. Letters patent give only the right to assert a property right and are barely, if anything, more than prima facie evidence of it. The mere grant of [fol. 181] letter can, for obvious reasons, be given no greater effect than this. An adjudication of validity in one case by a trial Court is binding upon another in a suit upon the same patent only so far as the rulings made are of persuasive force. This limitation of its effect is likewise necessary. There must, however, come a time when an adjudication of validity must be recognized as binding not only upon parties and privies but in all other suits. This does not mean an absolutely conclusive finding because every new litigant must be accorded his day in Court, but it does mean that the finding of validity will not be disturbed merely because the Court before which the later case is heard differs in opinion from the Courts which made the earlier adjudications. There must be, in the later case, something which would not merely justify and support a different ruling but something which compels it. The time when the found validity of letters patent should (within the limitation mentioned) no longer be regarded as an open question is at least when such an adjudication

has been made by a Circuit Court of Appeals. If such an adjudication is properly to be questioned, it should be by a Court of not less than like jurisdiction and equal authority.

These views call upon us to accept the finding of invention and that the inventive thought embodied in plaintiff's appliance is absent from the patent applications cited for reference. This brings us to the question of anticipation evidenced by prior uses not before brought to judicial notice. The ruling which we deem to be authoritative disposes of the effect of the proceedings in the Patent Office affecting the applications as to which an interference was declared because these proceedings were before the Court which made the adjudications. Respecting the newly evidenced prior uses, they [fol. 182] are not in themselves of the character which show that what Callahan has been found to have invented was anticipated by the invention of another. Indeed anticipation in a construction of this kind can never be shown with that clearness which will defeat a patent. All such structures are ephemeral, and no record is ever kept of what they are. The real significance of prior constructions is in their showing such a state of the art prior to the entry of Callahan as to forestall any finding of invention in what he did, or at least to take from him the credit of being the pioneer which (in the absence of this evidence) the Court of Appeals for the Sixth Circuit found him to have been. The inference is justified that if that Court had denied him the credit given, its finding would not have been what it was. This is because of the emphasis given to the finding that he was such pioneer.

We are not persuaded, however, that the evidence before us so far differs from the evidence in the former case as to compel a different finding from that then made. We feel, however, that defendant has a right to the expression of our conviction that had such finding of invention not been made, the evidence before us bearing upon the prior state of the art would have led us to the conclusion that no invention is disclosed by plaintiff's appliance, at least further than to confer upon him the right to a patent limited to the specific special construction which the patentee devised.

The final question is that of infringement. Here we are on new and different ground from that trod by the parties to the other cause. This question is before a Court for the first time. Accepting the finding of invention already made, which we have accepted and do now accept, the question is whether the invention thus found has been encroached upon by this defendant. The fifth claim defines the right found to belong to the plaintiff. The invention [fol. 183] there described is made up of a number of elements, every one of which had been found to be old. This finding is in practical effect binding upon us, and without it would be made by us. Invention and novelty must therefore be in the combination. The "boom" feature or element is the keystone of the arch of this combination. It is to be found not merely in the claim and in the application but also in the drawings and in the constructed appliance which embodied the invention claimed. Plaintiff advances and relies upon two propositions, neither of which we are able to accept.

One is that the two elements of conduit and supporting boom do not mean two integers or units, but that the conduit itself may be both, if it is both a conduit and a boom. This has not been found to be nor do we find it to be the meaning of the claim. The boom element is a boom "carrying the conduit." This ex vi termini means two entities—conduit and boom. There are not only functionally but physically two elements (among the others) in the combination. If the boom is made to also serve the purpose of a conduit or the conduit of a boom, there is physically only one element, although it has a double function.

The other proposition comes in practical effect to this that if an inventor goes to the prior art and takes therefrom five elements, which he puts together in a combination constituting a patentable invention, and another man goes to the possession of the same art and takes therefrom four of these same elements, of which he makes a combination, thereby creating an appliance which will serve the same purposes and do all the work of the first and do it equally well, the two appliances are in a patentable sense the same. They are not. The invention is not in the elements nor in any one or more of them but in the combination and the combination is not the same [fol. 184] but a different one. The inventions are likewise not the same but different inventions.

The counter proposition which we advance is not in conflict with the doctrine of equivalents nor with the long line of cases to which we have been referred, which hold that a defendant cannot escape the charge of the infringement of a patented combination by devising an appliance which depends for its efficiency upon the presence of the patented combination but in which he has incorporated added elements which play no part in the combination. It is clear that what he has done is nothing but an attempt to hide infringement, not to avoid it.

The proposition on which we rely goes to the length that the man who has access to an art, rich not only in known elements, which may be combined, but rich also in number of combinations, and with the material thus supplied makes a new combination made up of a less number of elements than were before combined and yet one which in functions and results is all which the earlier combinations are, has not only infringed but has made a distinct advance in the art. Of course, the statement of the proposition must be understood to mean nothing more or less than what is expressed. It does not mean that elements may be added which give no added function nor that elements may be dropped so that the new aggregation may give some of the results of and thus be a partial substitute for the patented combination. In the former case infringement will always be found, and in the latter it may be found. When, however, as the proofs in the instant case show (what was not before shown) that those who practiced the art used appliances constructed of various combinations of these known elements, and all that the patentee did was to devise a special make of apparatus constructed [fol. 185] upon the principle of a combination of a given number of these known elements which has the merit of being a better ap-

pliance than those made up of fewer or other elements, all that the patent gives is a monopoly of that make of appliance. He cannot force the trade to use his superior make nor levy tribute upon it for the use of appliances which are not his appliance nor deprive the trade of the right before enjoyed of making appliances out of what the art supplied so long as the appliances which were thus made are not his appliance nor the equivalent of it. Chute conduits were in common use. They had to be supported or be constructed of sufficient strength to be self supporting. Either was expensive and otherwise open to objection. The thought of a "boom" to carry the conduit was an advance. In many respects the construction was a better construction. This, however, gave the inventor of the boom construction no property right in a self-supporting conduit construction, and he does get the right by calling the conduit a boom. Of course, in a sense it is, and it may be that what this patentee invented was a conduit with the added functions of a boom. If so, however, this is not what he claimed, nor what was patented to him, and he gets not what he invented nor all which he invented, but only what was patented. The present plaintiff has no shadow of claim to more.

Our finding is that the defendant has not infringed and that the bill should be dismissed for want of equity.

The propositions of law upon which the ruling made depends are not in conflict with any of the cases to which we have been referred, including

Capital v. National, 70 Fed. 709;
International v. Brammer, 138 Fed. Rep 396;
McCormick v. Aultman, 69 Fed. Rep. 371.

[fol. 186] The bill of complaint is dismissed, with costs to defendant. To give definit-ness of date for appellate or other purposes to the decree indicated, it is not now made but the draft or a formal decree to this effect may be submitted.

IN UNITED STATES DISTRICT COURT

OPINION SUR REARGUMENT—Filed October 31, 1922

DICKINSON, *J*:

The defendants had in use at different stages of a construction job two different forms of appliances and apparatus for placing the concrete part of the work. The appliances and apparatus constitute in themselves each a structure. They are distinguished in this record as "Defendant's apparatus" and "Defendant's second structure." The special feature with which we are now concerned is what has been designated as a "Boom." The word has been borrowed from the nautical art to express the special function which a part of the patented hoisting apparatus has. The primary func-

tion of a boom is to keep the foot of the mainsail or other sail extended. This gives the name. It incidentally, and indeed of necessity, is adapted to accompany, and in fact facilitates, prescribed movements. These features of a boom are so prominent that they have come to be regarded as its special and peculiar functions, and because of them the word has been carried into the art under present consideration. These functions are in this art merely incidental although again necessary to be present. The primary and real function is to support the conduit. It has an adjustable attachment to [fol. 187] the mast enabling it to be freely raised and lowered vertically; to be swung in any horizontal plane or be tilted to any desired angle, but its real function is that above stated. If we have the right concept of the prior art structures and the advance made by the patentee, it was in the improvement made by providing a boom support for the chute or trough down which the concrete was conducted when in its wet state. "Defendant's apparatus" was without this boom. Inasmuch as the opinion made no specific reference to "Defendant's Second Structure" a formal reargument was allowed in order to get the desired finding upon the record. The finding of infringement was intended to include both structures. The state of the prior art as disclosed in the case in 262 Fed. Rep., 958, was such that the Court in that case found the patentee had made an advance in the art so marked and so meritorious that he should be deemed a pioneer.

The state of the prior art, as disclosed by the evidence in the instant case, is such that it is confidently asserted a finding against the patentee should be made and the patent issued held to be of no validity. The ruling made in the cited case, however, we have felt to be controlling, and the reasoning by which reached, on the evidence before that Court, convincing.

The evidence presented now, however, compels the finding that the sole merit in the patented apparatus consists in the introduction as a feature of the apparatus, of a boom whose function is to support the conduit part of the combined structure. "Defendant's apparatus" made use of a self-supporting conduit. Many of the conduits before in use were, however, supported. A number (perhaps all) were supported in such a way as to prevent the free swing or movement of the conduit. Any support which has the character-[fol. 188] istics of a boom support, and in that sense was an equivalent, would call for a finding of infringement. Any contrivance, however, would not be equivalent to a boom construction merely because the two appliances had the supporting function in common. The patentee has no monopoly of any form of construction unless it incorporated the boom support feature.

Our finding was and is that neither of defendant's structures or appliances in use contain as an element this boom feature. Halyards, topping lifts, braces or the like, would, it is true, make of any trough or conduit (with the other features present here) a boom in a sense. None of these, however, would make a boom support in the sense in which the word is used in the patentee's application and claims because there would be no conduit carrier or supported

by a boom, and none of the benefits of such a contrivance would be gained. This thought and these benefits make plaintiff's apparatus patentable, and to this it must be held.

The draft of a decree, as before outlined, may be submitted.

IN UNITED STATES DISTRICT COURT

SUPPLEMENTAL FINDING—Filed November 6, 1922

DICKINSON, J.:

We are asked to make a further formal additional ruling in this case. The requested ruling concerns the deposition of Charles W. Ellis and covers the question of the general admissibility of any deposition because evidence offered out of time and out of order; the question of whether the deposition as offered is within the scope of the motion to take additional proofs and whether the testimony of the witness to which specific objections were made is admissible.

We did not pass upon any of these questions because the dis- [fol. 189] position made of the case rendered the whole of the deposition valueless. The parties, however, desire the ruling now asked for to be made, and we accordingly make it.

Trials of equity cases are now assimilated to trials of actions at law when the Courts sit without the assistance of the jury. In this view of it whether the testimony of a witness who is called out of order or who is called after that line of testimony has been closed should be admitted as a question wholly for the exercise of the discretion of the trial Judge. We exercise that discretion in favor of opening the door to the admission of this testimony so far as it is otherwise admissible.

The second objection to the admission of the testimony that it is beyond the scope of the permission granted to take additional testimony is of like character with the first objection, and a like ruling is made thereon.

The objections, however, made to a number of the statements credited to the witness on the ground that he was testifying to matters objectionable as hearsay are sustained, and the testimony of the deponent as a witness in the cause is excluded except as to these matters of which he showed a personal knowledge. In other words, the substance of the testimony of this witness is reduced to the proposition of fact that at the times of his visits to the various localities mentioned he saw in use the appliances and apparatus to which he referred, and the character of them so far as he has described them, and to his negative testimony that although in a position to have known it, he had no knowledge that the users of these appliances had paid a royalty, or been licensed by the Concrete Appliances Company for such use. This negative statement goes only to the weight of whatever evidence there is in the cause [fol. 190] that users of these appliances had so paid for the right to use them.

We think the foregoing covers all the essential rulings worth while to be made with respect to this deposition. To follow the whole of the testimony for the purpose of making specific rulings upon every objection made would be almost interminable. There is, however, one other possible question which we do not understand to be pressed. In case it should be, we make a ruling upon that also. It is substantially that a deposition taken in support of an interlocutory motion is not admissible as a deposition expressly taken for trial purposes. When, however, a witness has deposed just as he would have deposed if the deposition had been in form for trial purposes, and he has been fully examined and cross-examined, we see no occasion to require him to give his deposition a second time merely to cover this purely formal difference. A deposition so taken may be admitted for trial purposes as if, although taken primarily in support of a motion, it had been taken secondarily by anticipation as a trial deposition to be accepted or rejected as the Court should determine. We have so regarded and so treated this deposition.

An exception is allowed to the respective parties for every ruling now made whether of admission or rejection of the testimony embodied in this deposition.

IN UNITED DISTRICT COURT

DECREE—Filed November 20, 1922

This cause having come on to be heard upon complete proofs, and upon oral arguments and briefs presented by counsel for the respective parties, it is hereby,

[fol. 191] Ordered, adjudged and decreed—

1. That the apparatus complained of in this cause, as constructed and used by the defendants herein, does not infringe any of the claims of said letters patent, in issue.

2. That the bill of complaint herein be, and the same is, hereby dismissed for want of equity at the cost of said plaintiffs, the same to be taxed; and that the defendants have execution therefor.

By the Court, Dickinson, United States District Judge.
Dated November 20, 1922.

Approved as to form: Cyrus N. Anderson, Solicitor for Plaintiffs; George Bayard Jones, Solicitor for Defendants.

IN UNITED STATES DISTRICT COURT

DEFENDANTS' BILL OF COSTS—Filed December 26, 1922

1920.			
		Attorneys' docket fee	$20.00
		Drawing defendants' answer	16.50
July	31.	Photoprints of concrete apparatus offered in evidence later	1.70
Aug.	5-10.	Cost of photographs and blue prints of Cincinnati and St. Louis uses, later offered in evidence, and later duplicates for opponent	25.70

[fol. 192] Defendants' Bill of Cost

1920.			
Aug.	7.	Cash paid for certified copies of the Engineering News from Patent Office	5.80
"	"	Cash paid for certified copies of preliminary statements in Callahan-Smith interferences	4.10
"	18.	Cash paid for further certified copies of preliminary statements of Callahan and Emtman	1.20
Sept.	23.	Photographic reproductions of St. Joe, Mo., building, Exhibit 14	1.20
"	30.	Cash paid Eastman Bros. for printing answer	15.00
Nov.	3.	Certificate of Clerk of District Court re Witherspoon-Englar suit, part of Exhibit 65	.50
"	30.	Negatives and duplicate photoprints of original photographs of Great Lakes Dredge & Dock Co., Exhibit 17	11.90
"	"	Services of Notary Public in taking depositions of witnesses Woodward, Woodman, Mensch, Sinks and Cameron	124.00
1921.			
Jan.	19.	Certified copy of further interference papers in Smith v. Emtman	.75
"	21.	Photographs of Exhibit 24, Culp Sketch	.70
"	22.	Witness and subpœna fees re deposition of A. L. Smith	1.75
"	31.	Notarial charges for taking deposition of of A. Smith in Washington January 14.	20.00

[fol. 193]

Jan.	31.	Notarial charges for depositions of Preston and Tatterson	44.00

Jan.	31. Notarial charges for taking deposition of A. E. Culp in Cincinnati, January 19...	13.63
"	" Notarial charges for taking depositions of Alderman, Cameron, Creutz, Patterson and Anderson in Chicago.....	65.00
Feb.	14. Photoprints of fifteen magazine pages.....	15.00
"	" Notarial charges for St. Louis depositions of Bankes, Bansack, Black, Goebel, Hopkins, Hughes and Webb.....	95.75
"	" Blue print exhibits.....	2.04
"	" Blue print of Iroquois plant (Ex. 27)....	.25
"	19. Disbursements to United States Marshal in St. Louis for subpœnaing Bankes.....	1.00
"	25. Notarial charges for taking depositions of Stimson, Blake and Squires in Chicago..	56.00
Mar.	16. Cash paid for Notarial services in Los Angeles	5.00
"	25. Two copies of old Engineering Record exhibits	.70
"	26. Cash paid Los Angeles photographer for photographic exhibits No. 44.....	9.40
"	31. Cash paid Laird Stenographic Agency for Los Angeles depositions.....	95.00
April	2-4. Cash paid Notary Public for taking depositions of Bannister, Fucik, Folewell and Hughes	59.40
[fol. 194]		
April	5. Cash paid Notary Public in Jackson, Mich., for deposition of Fargo.....	3.75
"	21. Photoprints of Bannister exhibits.....	.70
"	22. Reproductions of Weber Dam photographs, exhibit.....	1.00
May	10. Notarial services in Los Angeles for depositions of Wetzel and Johnson.....	5.00
"	" Typists's charges for transcribing depositions	25.00
"	" Balance due Laird Stenographic Agency, Los Angeles, for same.....	2.50
"	31. Blue prints of San Francisco drawing, Exhibit 61.....	.25
"	" Paid Owen, Notary Public, for remaining San Francisco depositions (Horton, Brown, Ayer)	69.00
July	30. First of three installments to printer for printing record in suit.....	300.00
Aug.	31. Second installment for record.....	300.00
Sept.	30. Balance paid for printing record.....	391.20
"	" Certificate of title of Callahan patent.....	5.00
Oct.	3. Cash paid Philadelphia Court reporters for typing open court testimony.....	25.00

party defendant of record, has agreed to contribute in whole or in part to the expense of the litigation and that the costs asked to be taxed were costs paid not by the record defendants but by the contesting defendant. The exception is not based upon the doctrine of champerty or maintenance but upon the mere fact that the party to whom the costs are asked to be allowed had not in person made the outlay.

We content ourselves, without discussion of the reasons for so doing, with the dismissal of the exception.

The second exception is to the allowance as costs of the premium paid to the surety on the bond given by defendants following a motion by the plaintiff for a preliminary injunction. As the allowance of such an injunction would have interfered with construction work then in progress, the Court anticipating and hoping to escape discussion of the questions which it was foreseen would be raised, [fol. 199] inquired of the plaintiff to learn whether it would be satisfied with a bond assuring the payment of such damages as might be recovered and upon receiving an affirmative answer from the plaintiff, then inquired of the defendants whether they were content to give such bond, and upon an expression of their willingness so to do pro forma denied the motion for a preliminary injunction upon the entry of an accepted bond such as above indicated. The bond in a substantial sense was a voluntary one entered into by the defendants for their benefit and convenience. The case being one on the Equity side of the Court, the allowance of costs is in any event discretionary, and if this portion of the costs be not allowed to the defendants as costs, it is unnecessary to go into the inquiry of whether or not this item is properly a part of the costs generally allowed. This may require, however, a modification of the decree heretofore entered dismissing the bill, with costs to the defendants, and the decree heretofore made is accordingly modified and amended so as to be a decree dismissing the bill, with costs, as heretofore formerly decreed, except this item of defendants' bill, which is not allowed to them as costs.

The second exception is formally allowed, and the sum of the costs as taxes is reduced from the sum of two thousand three hundred and twenty-nine and fifty-nine hundredths dollars ($2,329.59) to the sum of two thousand one hundred and nineteen and sixteen hundredth dollars ($2,119.16).

[fol. 200] IN UNITED STATES DISTRICT COURT

ORDER ON EXCEPTIONS TO TAXATION OF BILL OF COSTS—Filed January 22, 1923

Before Dickinson, J.

A final decree dismissing the bill of complaint with costs to defendants having been entered herein the twentieth day of November, 1922, and the clerk having taxed defendants' costs in accord-

ance therewith in the sum of two thousand three hundred and twenty-nine dollars and fifty-nine cents ($2,329.59), which sum included two thousand one hundred and sixty-two dollars and nine cents ($2,162.09) not expended by defendants but by a party not a party to the record which latter amount included the sum of two hundred and ten dollars and forty-three cents ($210.43), paid by such party to a surety company as premiums on a bond; and plaintiffs having filed exceptions to the said bill of costs as taxed on the grounds (1), that it was error to tax as costs items of expenditure not made by the defendants, but by a party not a party to the record, and (2), that it was error to tax as a part of the costs the items expended as premiums for said surety bond, and the said exceptions having been argued by counsel for the respective parties, and upon consideration of the said exceptions it is,

Ordered, adjudged and decreeed, as follows, to wit:

1. That the first of said exceptions be and the same hereby is dismissed.

2. That the second of said exceptions be and the same hereby is allowed.

3. That the paragraph numbered 2 of the decree of November 20, 1922, be amended to read as follows:

"That the Bill of Complaint herein be, and the same is, hereby [fol. 201] dismissed for want of equity at the cost of the said Plaintiffs, except that costs for the premiums for Defendants' bond are not allowed, the costs allowed to be taxed"; and

4. That defendants' costs be taxed in the sum of two thousand one hundred and nineteen dollars and sixteen cents ($2,119.16), and that said defendants have execution therefor.

By the court.

Attest:

George Brodbeck, Clerk.

Dated January 22, 1923.

Approved as to form: Cyrus N. Anderson, Solicitor for Plaintiffs; Wm. Steell Jackson, Solicitor for Defendants.

In United States District Court

Stipulation as to Payment of Costs—Filed January 30, 1923

In order that the record in this case on appeal as to the payment of costs by parties not defendants here and who have not intervened may be complete, counsel stipulate:

That at the hearing before the clerk of court upon taxation of costs, solicitor for plaintiffs urged that the outlays sought to be taxed as costs had not been paid by the actual defendants in the cause but had

been paid by parties not of record as defendants nor as interveners in the cause; and that solicitor for defendants freely admitted the fact and stated that all the expenses of defending the suit had been [fol. 202] assumed by Sackett Screen and Chute Company of Chicago, the manufacturer of the machinery of whose use complaint was made and that all of the outlays included in the costs sought to be taxed except one item of six dollars ($6.00) had in fact been paid by Sackett Screen and Chute Company and another.

That prior to the hearing in the District Court on exceptions from the clerk's taxation of costs solicitor for defendants submitted a memorandum on behalf of defendants setting forth the fact that all of the outlays sought to be taxed as costs except six dollars ($6.00) had been paid by Sackett Screen and Chute Company, the manufacturers, and Archer Iron Works of Chicago.

That the payments by Sackett Screen and Chute Company and Archer Iron Works of the outlays sought to be taxed were freely stated and admitted by solicitor for defendants at the oral hearing in the District Court and were accepted as the fact upon which the opinion of the Court was based.

That the fact of the payment of these outlays by Sackett Screen and Chute Company and Archer Iron Works, for and on behalf of the defendants in this cause is stipulated nunc pro tunc as a matter of record at the time of the hearing before the clerk of the court upon taxation of costs, with the same force and effect as if this fact had been formally of record at that time.

(Sgd.) Cyrus N. Anderson, Solicitor for Plaintiffs. Wm. Steell Jackson, Solicitor for Defendants.

Philadelphia, Pennsylvania, January 30, 1923.

[fol. 203] IN UNITED STATES DISTRICT COURT

PETITION FOR AND ORDER ALLOWING APPEAL—Filed January 30, 1923

The above-named plaintiffs, conceiving themselves aggrieved by the decree made and entered on the twentieth day of November, 1922, in the above-entitled cause and by the order made and entered the twenty-second day of January, 1923, in said cause, the latter being in part amendatory of the said decree, do hereby appeal from the said decree and order to the United States Circuit Court of Appeals for the Third Circuit for the reasons specified in the assignment of errors, which is filed herewith, and they pray that this appeal may be allowed, and that a transcript of the record, proceedings and papers upon which said decree and order were made, duly authenticated, and that the various physical exhibits filed on behalf of the respective parties may be sent to the said United States Circuit Court of Appeals.

Arthur M. Hood, Cyrus N. Anderson, Attorneys for Plaintiffs.

Before Dickinson, J.

The foregoing claim for appeal is allowed upon filing cost bond in the sum of $2,500.

By the court.

Attest:

George Brobeck, Clerk.

Philadelphia, Pa., January 30, 1923.

[fol. 204] IN UNITED STATES DISTRICT COURT

ASSIGNMENT OF ERRORS—Filed January 30, 1923

Come now the plaintiffs, by Cyrus N. Anderson, their solicitor, and say that in the record and proceedings and decree in this cause, there is manifest error in this, to wit:

First. The Court erred in holding and deciding that claims 1, 2, 5 and 13 of the Callahan patent sued upon are not infringed by the structures of the defendants.

Second. That the Court erred in dismissing the bill of complaint for want of equity.

Third. That the Court erred in awarding costs to the defendants.

Fourth. That the Court erred in awarding to the defendants, as items of taxable costs, items of expenditure amounting to one thousand nine hundred and fifty-one dollars and sixty-six cents ($1,951.66) not expended by defendants but expended on behalf of defendants by a party not a party to the record, said items, excepting a single item of six dollars not included therein, being all of the items of alleged taxable expenditure.

Fifth. That the Court erred in granting a decree for defendants, whereas, said decree should have adjudged that the defendants had infringed claims 1, 2, 5 and 13 of the aforesaid Callahan patent and that said Callahan patent was valid.

Wherefore the plaintiffs pray that the said decree be reversed.

(Sgd.) Cyrus N. Anderson, Solicitor for Plaintiffs.

Philadelphia, Pa., January 30, 1923.

[fol. 205] IN UNITED STATES DISTRICT COURT

PRÆCIPE FOR TRANSCRIPT OF RECORD—Filed January 30, 1923

To the clerk of the court:

You will please prepare a transcript of the record on appeal in the above-entitled cause and include therein the following:

Bill of complaint.
Answer.
Amendment to answer.
Testimony of defendants' witnesses Thompson and Insley in open court.
Defendants' printed record.
Plaintiffs' printed record.
Testimony of defendants' witnesses Williams and Bruner in open court, and deposition of Charles W. Ellis.
Testimony of plaintiffs' witnesses Ginsburg, Engstrum and Insley in rebuttal in open court.
Testimony of defendants' witnesses Horton and Ayre, and of plaintiffs' witnesses Kebby and Tibbitts taken in California after final hearing.
Decree.
Opinions of Judge Dickinson.
Defendants' bill of costs as taxed.
Petition for appeal.
Assignment of errors.
Bond.
Citation.
Plaintiffs' exhibit N, patent in suit.
Defendants' exhibits 36, 38, 63, 67 and 68.
Exceptions to defendants' bill of costs.
Order of January 22, 1923.
Defendants' interrogatories.
Plaintiffs' answers to defendants' interrogatories.
[fol. 206] Stipulation as to payment of costs (dated January 30, 1923).
All other exhibits are to be forwarded to the Court of Appeals, under agreement of counsel, as physical exhibits.

Arthur M. Hood, Counsel for Plaintiffs.

Indianapolis, Indiana, December 16, 1922. Chicago, Illinois, December 18, 1922.

Approved. George Bayard Jones, Counsel for Defendants.

[fols. 207 & 208] In United States District Court

Clerk's Certificate

United States of America,
Eastern District of Pennsylvania, set:

I, George Brodbeck, clerk of the District Court of the United States for the Eastern District of Pennsylvania, do hereby certify that the annexed and foregoing is a true and faithful copy of so much of the pleas and proceedings in the case of Concrete Appliances Company and William H. Insley v. John E. Gomery, John C. Schwartz,

Michael J. O'Meara, and Concrete Construction Company, No. 2067, June Term, 1921; as per præcipe filed, a copy of which is hereto attached, the transcript of record in the above-entitled cause is to include, now remaining among the records of the said court in my office.

In testimony whereof I have hereunto subscribed my name and affixed the seal of the said District Court at Philadelphia, this twenty-sixth day of February, in the year of our Lord one thousand nine hundred and twenty-three and in the one hundred and forty-seventh year of the Independence of the United States.

George Brodbeck, Clerk. (Seal.)

665
209-211

DEFENDANTS' EXHIBIT 66

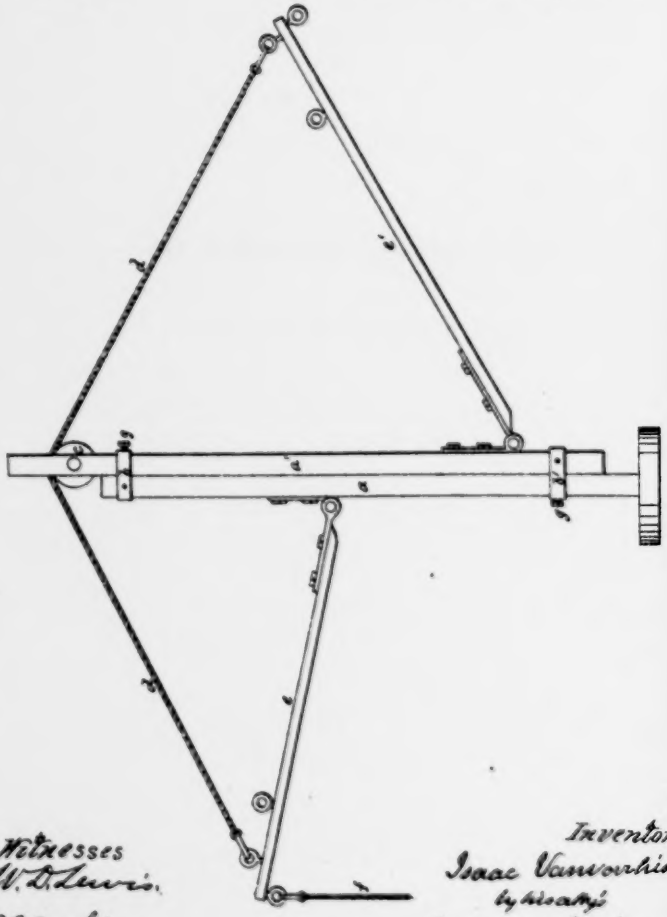
PATENTS SET UP IN ANSWER

666
212

I. Van Voorhis,

Derrick.

No. 69,375. Patented Oct. 1, 1867.



Witnesses
W. D. Lewis.
G. B. Bushing.

Inventor
Isaac Vanvorhis.
by his Att'y
Bakewell & Baldwin

667
213-215

UNITED STATES PATENT OFFICE.

ISAAC VAN VOORHIS, OF HILLSBOROUGH, PENNSYLVANIA.

IMPROVEMENT IN HAY-DERRICKS.

Specification forming part of Letters Patent No. **69,375**, dated October 1, 1867.

To all whom it may concern:

Be it known that I, ISAAC VAN VOORHIS, of Hillsborough, in the county of Washington and State of Pennsylvania, have invented a new and useful Improvement in Derricks and Hoisting Apparatus; and I do hereby declare the following to be a full, clear, and exact description thereof, reference being had to the accompanying drawing, making part of this specification, which is a side elevation of my improved derrick or apparatus for hoisting.

The nature of my invention consists in the construction of an improved derrick for raising or hoisting large bodies or heavy weights.

To enable others skilled in the art to make and use my invention, I will proceed to describe its construction and operation.

The main post *a*, of any desirable length and of sufficient size to secure the requisite strength, rests on a turn-table of the ordinary construction, or on any other desirable foundation, and is securely fastened thereto, or connected in such a way as to rotate at pleasure. It is usually made of uniform size its entire length with a square or rectangular transverse section. At or near its upper end, and attached thereto, is a band, *b*, made sufficiently large to encompass a similar post, *a'*, at or near the lower end of which, and attached thereto, is a similar band, *b'*, *b* and *b'* being so fitted as to allow the post *a'*, sliding along the post *a*, to be raised or lowered at pleasure. In the upper end of the post *a'* is a grooved or pulley wheel, *c*, over which passes a cord, rope, strap, or chain, *d*, one end of which is attached to the arm *e*, which is hinged to the post *a*, and the other end to the arm *e'*, hinged to the post *a'*. The weight to be raised is attached at or near the outer end of the arm *e'* by the hook represented in Fig. 2, or by other similar device in common use, and the hoisting-power similarly applied to the other arm, *e*, by a rope or chain, *f*, which may be worked by a capstan or other equivalent device, or by hand, as preferred.

The devices thus described are adjusted to each other and to weight and power in any desirable proportions, or they are so made that the relation of power, weight, and distance can be varied at pleasure, in accordance with the generally-known principles governing the application of power by levers and pulleys. The points on the arm *e'* at which the rope *d* and the weight are attached, also the points on the opposite arm, *e*, for attaching the ropes *d* and *f*, may any and all be varied at the pleasure of the operator, or according to the amount of power which is available or the work to be done. Commonly I provide two or more places on each arm *e* and *e'*, to which to attach the rope *d*. The places for hinging the arms *e* and *e'* may also be varied at pleasure, in accordance with the same general and well-known laws. The derrick thus described is very accurately balanced, and requires only to be braced or stayed sufficiently to steady it from falling by its own weight or prevent its swinging to either side when in actual use, unless the posts *a* and *a'* are set obliquely, which is seldom, if ever, necessary.

By the devices thus described I secure a derrick or hoisting apparatus self-balancing, and either portable or stationary, and applicable to any and all purposes of hoisting or lifting for which derricks are ordinarily used, or for which hoisting apparatus is required. For the purpose of raising the post *a'*, I employ a screw, lifting-jack, pulley, or any of the common mechanical powers in their ordinary forms of application, and hold it in position by screws *g*.

In the derrick as above described the two posts *a* and *a'* are not both necessary, though I generally so construct it. A single post may take the place of the two, the pulley *c* be pivoted in its upper end, the arms *e* and *e'* hinged to its opposite sides, and the mode of operation be substantially the same. Nor do I limit myself to the method of hinging specified in order to connect the arms *e* and *e'* to their posts *a* and *a'*, as I employ for that purpose any device in ordinary use which will give a firm working joint. The post *a'* may also be made in such a way that the pulley *c* can be hung higher or lower at any desirable point.

What I claim as my invention, and desire to secure by Letters Patent, is—

A portable self-balancing derrick consisting of one or more upright posts with arms hinged on opposite sides, such arms connected with each other in the manner described, and the whole operating substantially as and for the purposes above set forth.

In testimony whereof I, the said ISAAC VAN VOORHIS, have hereunto set my hand.

ISAAC VAN VOORHIS.

Witnesses:

EDWARD TAYLOR,

G. TAYLOR.

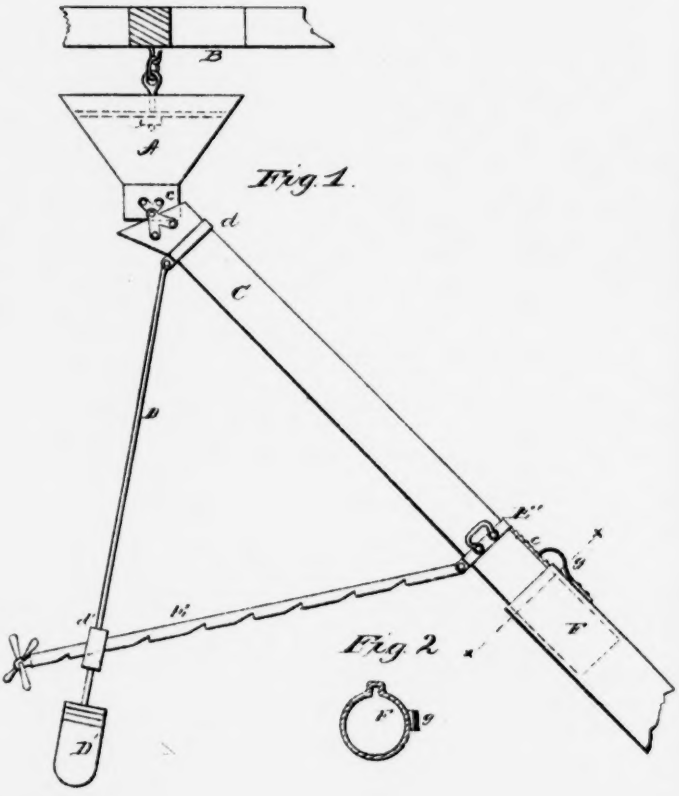
668
216

(No Model.)

W. TOEPFER.

Grain Distributer for Malt Kilns, &c.

No. 243,327. Patented June 21, 1881.



Witnesses.
Franck L. Durand
J. J. McCarthy

Inventor
Wenzel Toepfer
By S. S. Stout
Attorney

669
217-219

UNITED STATES PATENT OFFICE.

WENZEL TOEPFER, OF MILWAUKEE, WISCONSIN.

GRAIN-DISTRIBUTER FOR MALT-KILNS, &c.

SPECIFICATION forming part of Letters Patent No. 243,327, dated June 21, 1881.

Application filed April 11, 1881. (No model.)

To all whom it may concern:

Be it known that I, WENZEL TOEPFER, of Milwaukee, in the county of Milwaukee and State of Wisconsin, have invented certain new and useful Improvements in Grain-Distributers for Malt-Kilns; and I do hereby declare that the following is a full, clear, and exact description thereof.

My invention relates to devices for distributing grain as it is delivered from a higher to a lower level, and will be fully described hereinafter.

In the drawings, Figure 1 is a side elevation of my invention. Fig. 2 is a section on line *x x*.

A is the hopper, which is suitably hung beneath a spout, B, which passes from the upper floor by a link and eyebolt, which permit it to turn about a vertical center.

C is a delivery-spout, which is hinged to the hopper by brackets *c c*, and just below the brackets I securely attach a band, *d*, to the spout, and to this band I hinge a bar, D, upon which I suspend a weight, D'. I slightly enlarge the rod D just above the weight, and slot it to receive a notched bar, E, which I hinge to the lower end of the spout by band E'.

In the lower edge of the slot in bar D, I provide a catch, which is adapted to fit in the notches in bar E.

Just below the band E', I attach a strip, *e*, of angle or T iron to the spout C, which strip is notched to receive a spring-catch, *g*, that is fastened to an extension-spout, F, a longitudinal groove or crease in the extension-spout accommodating rib *e* and holding the extension-spout against any tendency to turn, so as to carry the spring-catch out of engagement with the notched strip.

Operation: The weight D', causing rod D to draw upon one side of the spout C, will have a tendency to throw the spout out of a perpendicular, and render it easy for a person at the handles of the bar E to thrust it the (spout) out farther, and thus distribute the grain uniformly throughout the floor, the notches in bar E engaging with a catch in the enlargement *d'* of rod D to hold the spout at any desired angle.

My device is specially designed for distributing malt on kiln-floors.

I design providing the spout and extension with suitable handles, by which they may be operated independently of bar E.

I claim—

1. In grain-distributers for malt-kilns, &c., a hopper having hinged spout, in combination with a rod, D, carrying a depending weight or counter-balance, as set forth.

2. In grain-distributers, the combination of the hopper and spout, hinged together, with the weighted rod D and notched bar E

3. In combination with the hinged spout having notched rib *e*, the extension-spout having groove and spring-catch, as set forth.

In testimony that I claim the foregoing I have hereunto set my hand this 21st day of March, 1881.

WENZEL TOEPFER.

Witnesses:
JOE MELICHAR,
S. S. STOUT.

670

220–221

(No Model.) 2 Sheets—Sheet 1.

J. EDWARDS & J. R. F. KELLY.

DREDGING APPARATUS.

No. 366,468. Patented July 12, 1887.

Fig. 1.

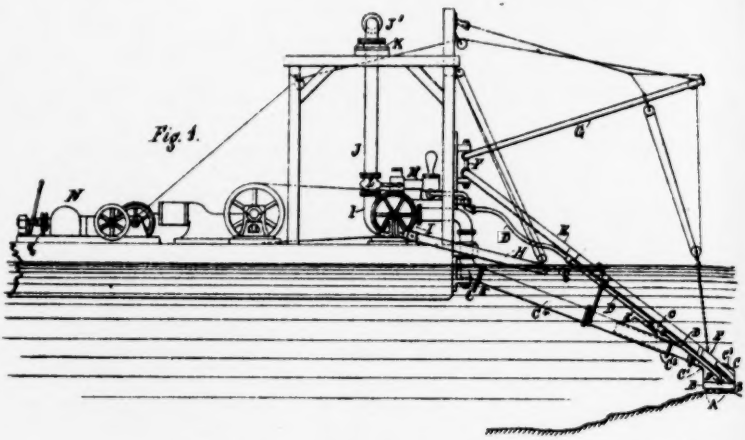
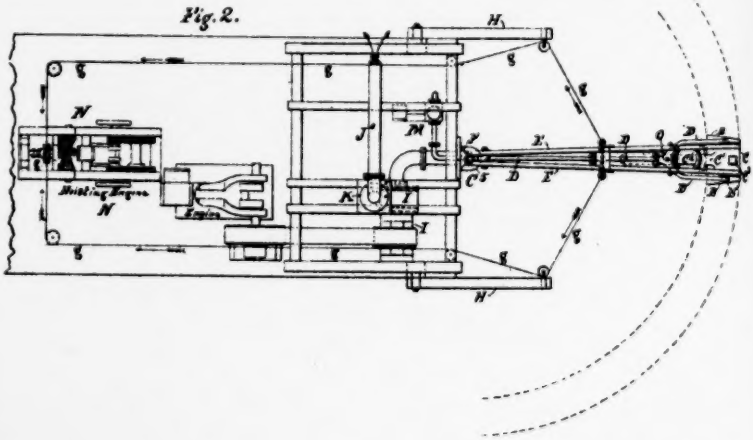


Fig. 2.



WITNESSES:
A. M. Pierce
M. E. Roberts

INVENTORS:
Joseph Edwards
James R. F. Kelly
for Wm. H. Weightman
atty

671

222

(No Model.) 2 Sheets—Sheet 2.

J. EDWARDS & J. R. F. KELLY.

DREDGING APPARATUS.

No. 366,468. Patented July 12, 1887.

Fig. 3.

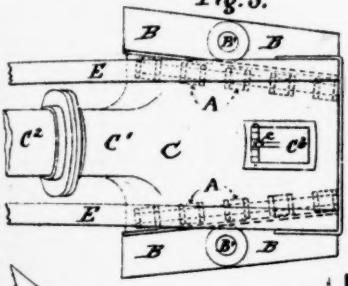


Fig. 4

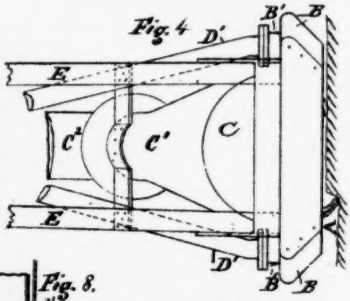


Fig. 5.

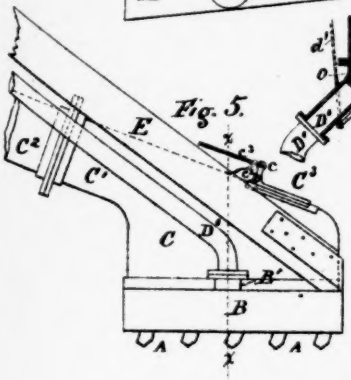


Fig. 8.

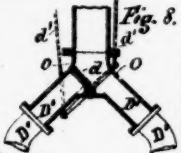


Fig. 6.

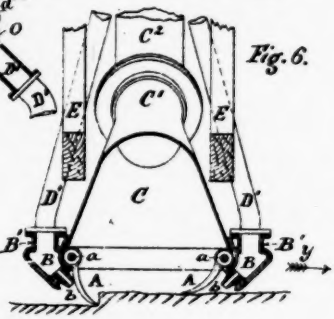
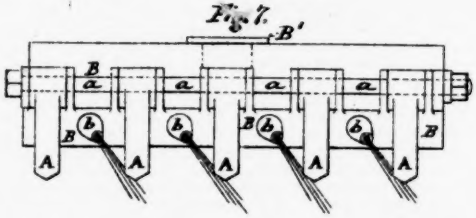


Fig. 7.



WITNESSES:-
A. M. Pierce.
M. F. Roberts.

INVENTORS:-
Joseph Edwards
James R. F. Kelly
per Wm. H. Deighton
atty

672
223

UNITED STATES PATENT OFFICE.

JOSEPH EDWARDS AND JAMES R. F. KELLY, OF BROOKLYN, NEW YORK.

DREDGING APPARATUS.

SPECIFICATION forming part of Letters Patent No. 366,468, dated July 12, 1887.

Application filed February 14, 1887. Serial No. 227,302. (No model.)

To all whom it may concern:

Be it known that we, JOSEPH EDWARDS and JAMES R. F. KELLY, citizens of the United States, residing in Brooklyn, Kings county, and State of New York, have invented certain new and useful Improvements in Dredging Apparatus, of which the following is a specification, reference being had to the accompanying drawings.

Certain improvements consist specially in a dredging-drag composed of a series of loosely-suspended diggers or plows, by means of which the earth or mud at the bottom of a river or harbor is loosened, of a series of pressure-jets arranged in conjunction with the loosely-suspended diggers or plows, by means of which a constant abrasion of the loosened mud or earth is brought about, and of an inverted funnel or nozzle to which the said diggers and jet-nozzles are attached, and up through which by suction the loosened material, mingled with water, is withdrawn for deposit elsewhere.

Certain improvements also consist in a special supporting frame-work projected from the dredging end or side of a staging, scow, or vessel directly to the dredging-drag, through which all support and necessary movement is conveyed in the operation of said drag, thereby preventing any direct or undue strain from coming upon the drag itself, the suction or discharge connections, the pressure-connections for jets, or upon the several bearings, swivels, and steps of the same.

Other improvements consist in the combination of the several portions or details, collectively or with each other, of which the dredging apparatus is composed, as may hereinafter be described or claimed.

In the drawings, Figure 1 represents a general elevation of a dredging apparatus embodying our improvements. Fig. 2 represents a plan view of the same. Figs. 3, 4, and 5 represent a plan, front and side view of a dredging-drag presenting improved details of construction and method of operation. Fig. 6 represents a transverse section on line $x\ x$ of Fig. 5 and through one of the jets, showing preferred method of putting the parts together. Fig. 7 is an enlarged view of manifold with four jets attached thereto and five diggers suspended from the same. The number of jets and loosely-suspended diggers may be increased to suit the nature of the bottom to be worked. The radial lines from jet-nozzles show method of directing the jets in their work. Fig. 8 is a detail view of flap-valve for supplying pressure to jets in either manifold to suit direction in which the work is being done.

Similar letters of reference designate like parts in all the figures.

A designates the loosely-suspended diggers; B, a pair of manifolds to which the jet-nozzles are secured, varying in size and number according to the nature and amount of discharge required.

C is an inverted funnel strongly framed, to which the manifolds B are attached, and from and within which the diggers are suspended. This inverted funnel C is formed, preferably, with an easy taper to the nozzle, up through which by direct suction the disintegrated material mixed with water is drawn. To prevent choking the suction, a water-valve, C', is attached to the upper portion of inverted funnel, and when too much material and too little water gets into the suction-pipes an extra and independent supply of water can be secured. To supply the manifolds with pressure, preferably of water, the inlets B' and connections D' to pressure pump are provided, the connections D being made flexible, preferably of rubber.

In the section, Fig. 6, a pair of manifolds are represented as attached to the siding of the inverted funnel C, and branch connections D' provided for each. These branch connections are continued up toward the vessel or scow and brought together at earliest opportunity in a Y-connection, as shown at O in Figs. 1, 2, and 8, and a flap-valve, d, (see Fig. 8,) set at the junction of the arms to control the inlet to either of the connections leading to manifolds B. The flap-valve d is controlled automatically or by power applied from the scow, staging, or vessel. As represented in the drawings, Fig. 8, the flap-valve d has a double handle, to the two ends of which hold is taken through cables d', either one of which being pulled closes the opposite branch connection leading to manifolds.

The water-valve C' may be a balanced valve,

which, upon internal suction being reduced, owing to the choking of the suction-connection, opens and admits a special supply of water automatically, or it may be operated as shown in Fig. 5, where hold is taken of the handle by cable or rod c' at the handle c. The maximum of weight being on the side of the valve, it will shut as soon as released and open when a strain is put upon the cable. A spring, c^2, may be located behind the valve to assist in the closing, or the suction of the funnel may assist.

The manifolds B are shown set at an angle to each other and to the radius of movements, (see Fig. 3;) but the funnel C may be shaped to suit choice or requirements, the neck C' being of any suitable length, and the manifolds and diggers attached below, as shown in Fig. 6.

To effect necessary movement or travel of the dredging-drag and provide for its successful operating, a supporting frame-work, as shown at E, is attached to it and continued to a staging on shore or to a scow or vessel on water, as may be necessary. Here the frame-work is attached to a self-adjusting hanger, F, to permit of radial movement in any direction. The framing being stiff and non-elastic and being rigidly attached to the drag, takes all the thrust and strain of movement and work and relieves the several flexible connections and bearings from undue strain. A boom, G, is similarly connected to the vessel and extended upward and outward above the drag-framing E, from which the drag, by means of cables, is raised or lowered, as required. Side cables, g, are provided and connection made with hoisting engine or power to move the drag in a circular path, controlled by central attachment, F. These cables g are attached to framing E well down toward the drag, and the direction of their pull is controlled by the adjustable side timbers, H. These timbers are raised and lowered at their outer ends to suit depth of water and angle of bearing timbers or framing E. To provide for a free movement of the drag, a telescopic expansion-joint, C^3, in the suction-connection permits of extension or shortening, as required. A rubber suction-hose forms part of suction connection at C^3 to accommodate varying depth of water and cut. These several portions are securely suspended from or attached directly to the frame-work E. Beyond the branch connections O of the pressure-pipes a flexible connection, D, is made to accommodate the varying reach and depth of dredging already referred to. Both suction and pressure connections are preferably provided with swivel-joints, as at C^2, attached to the vessel, placed in direct center line of drag movement and frame-center F.

A suction-pump, I, is placed on the vessel and connection made with suction-funnel of the drag. A discharge-pipe, J, is erected to connect with pump I, and is provided with a swivel-joint, K, and swinging branch J'. This branch J', being swung upon swivel-joint K, permits of a free discharge in any direction radiating from K as a center.

To operate the apparatus, pump I, preferably a cataract or pulsometer pump, is started, with the discharge-valve L in pipe J partially open, and such opening is gradually increased until full suction is obtained. The force-pump M is operated to supply pressure for jets b, and the drag being lowered to place, the side timbers, H, are adjusted to a direct pull of the cables g in either direction and the drag moved to and fro upon F as a center. The diggers A are loosely suspended from rod a, and, being backed by the manifold and funnel-framing in their work, drop by gravity into position for digging. Under such circumstances, when the drag is moving in a direction as indicated by arrow y, Fig. 6, the left-hand set of diggers drop to their work, while the right-hand set drag idly over the surface of river-bottom, and vice versa, with the movement of the drag. In either case the flap-valve d of connection O is swung to suitably operate the jets upon the diggers while at work. Thus the diggers loosen the earth or mud, the jets break it up and mix it with water, and the suction, drawing it up, passes it through the discharge-connections, to be deposited in any direction from the vessel.

What we claim as new, and desire to secure by Letters Patent, is—

1. A dredging-drag consisting of an inverted suction-funnel, to the lower portion of which are attached manifolds provided with jet-nozzles and a series of loosely-suspended diggers, substantially as set forth.

2. A dredging-drag consisting of an inverted suction-funnel, to the lower portion of which are attached manifolds provided with jet-nozzles, and a series of diggers loosely suspended within said inverted funnel, in combination with a relief water-valve, substantially as and for purposes specified.

3. A dredging-drag consisting of an inverted suction-funnel, to the lower portion of which are attached manifolds provided with jet-nozzles and a series of loosely-suspended diggers, in combination with means for raising, lowering, and placing the same, substantially as shown and described.

4. In combination with a dredging-drag consisting of an inverted suction-funnel, to the lower portion of which are attached manifolds provided with jet-nozzles and a series of loosely-suspended diggers, the supporting frame-work to which said dredging-drag is attached, the swing-center F, and means for operating the same, substantially as set forth.

5. In a dredging-drag, the combination of an inverted suction-funnel, a series of manifolds, B, provided with jets b, and a series of loosely-suspended diggers suspended directly from said manifolds, substantially as set forth.

6. In a dredging apparatus, the combination of the dredging-drag herein shown and described, expansion-joint C^3, flexible joint C^1, swivel-joint C^2, and pressure-connections D, O,

674
225-227

and D', substantially as and for purposes set forth.

7. In a dredging apparatus, the combination of a dredging-drag of the character herein shown and described, pressure-connections D, branching connections O, side connections, D', and manifolds R, substantially as and for purposes specified.

8. In a dredging apparatus, in combination with a dredging-drag consisting of an inverted suction-funnel, to the lower portion of which are attached manifolds provided with jet-nozzles and a series of loosely-suspended diggers, supporting frame-work E, carrying said drag, boom G, a vessel or staging to which said supporting frame-work and boom are attached, and means for raising, lowering, and operating said drag, substantially as set forth.

9. In a dredging apparatus, the combination of the dredging-drag herein shown and described, suction-connections C^3, C^4, and C^5, water-valve C^6, pressure-connections D, O, and D', suction-pump I, and pressure-pump M, all substantially as and for purposes set forth.

10. In a dredging apparatus, the combination of a dredging-drag of the character herein specified, suction-connections C^3, C^4, and C^5, suction-pump I, discharge-connections J and J', and swivel-joint K in discharge-connection J, substantially as and for purposes specified.

11. In a dredging apparatus, the combination of a dredging-drag of the character herein specified, a supporting frame-work, E, suction and pressure connections, as specified, suction-pump I, pressure-pump M, and discharge-connections J and J', provided with a swivel-joint, K, substantially as and for purposes specified.

JOSEPH EDWARDS.
JAMES R. F. KELLY.

Witnesses:
WM. H. WEIGHTMAN,
M. E. ROBERTS.

228–229

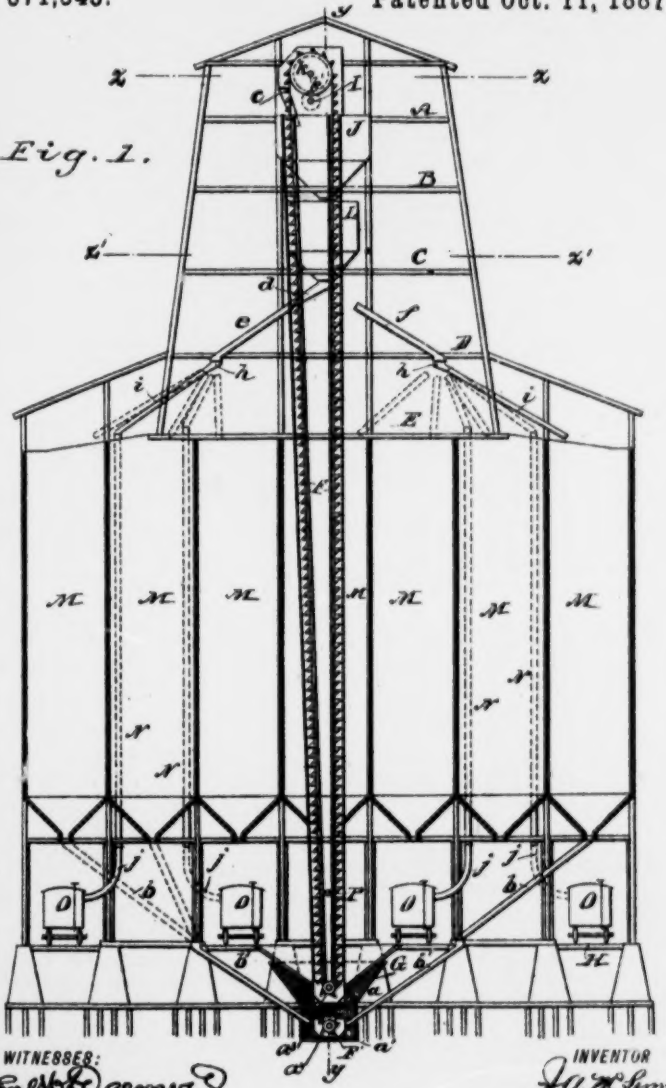
(No Model.) 3 Sheets—Sheet 1.

J. A. McLENNAN.

GRAIN ELEVATOR.

No. 371,343. Patented Oct. 11, 1887.

Fig. 1.



WITNESSES:

INVENTOR

BY

ATTORNEY

230–231

(No Model.) 3 Sheets—Sheet 2.

J. A. McLENNAN.

GRAIN ELEVATOR.

No. 371,343. Patented Oct. 11, 1887.

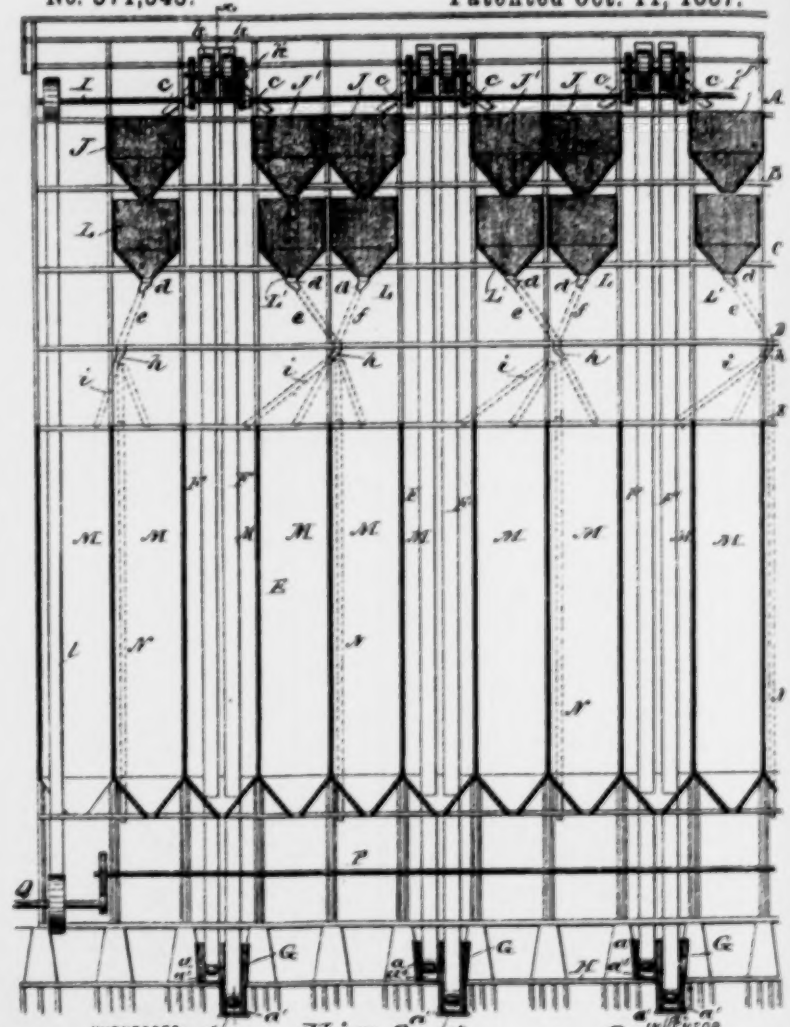


Fig. 2.

WITNESSES:

INVENTOR

Ja. McLennan

BY Munn & Co

ATTORNEY

(No Model.) 3 Sheets—Sheet 3.

J. A. McLENNAN.

GRAIN ELEVATOR.

No. 371,343. Patented Oct. 11, 1887.

Fig. 3.

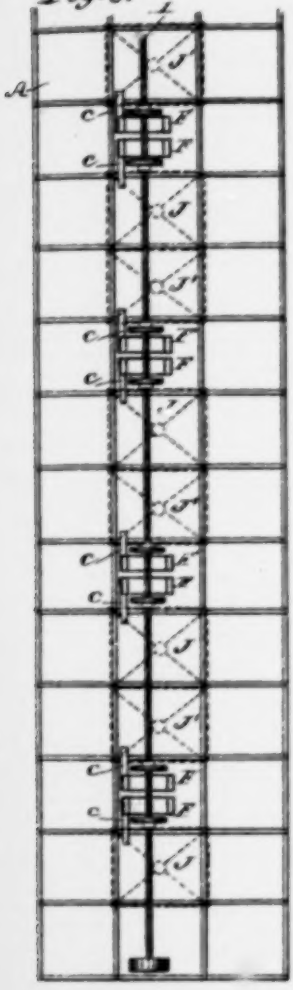
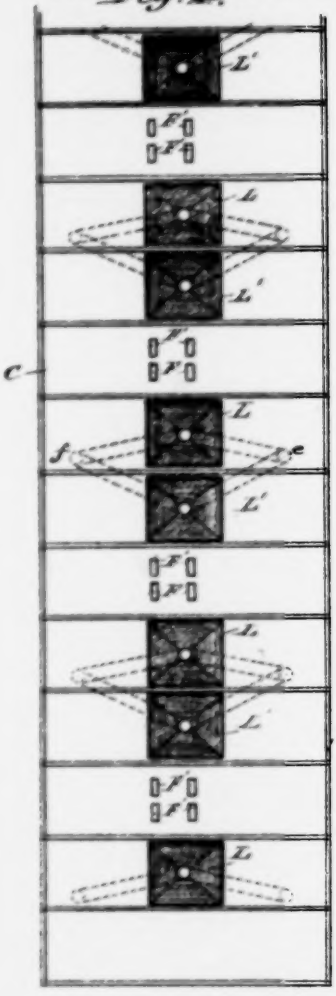


Fig. 4.



WITNESSES:

INVENTOR

BY

ATTORNEY

678
233

UNITED STATES PATENT OFFICE.

JOHN A. McLENNAN, OF CHICAGO, ILLINOIS.

GRAIN-ELEVATOR.

SPECIFICATION forming part of Letters Patent No. 371,343, dated October 11, 1887.

Application filed September 27, 1886. Serial No. 214,622. (No model.)

To all whom it may concern:

Be it known that I, JOHN A. McLENNAN, of Chicago, in the county of Cook and State of Illinois, have invented a new and Improved Grain-Elevator, of which the following is a full, clear, and exact description.

My invention relates to certain improvements in the construction and general arrangement of store-houses or elevators for storing, cleaning, or transferring grain and other agricultural products.

Heretofore it has been the practice in constructing large elevator-buildings to place all the receiving-elevators in line, leaving a distance between each elevator nearly the length of a railway-car, and to locate the shipping or transferring elevators in one or more lines parallel to the line of receiving-elevators, but in different tiers of bents of the building. This arrangement necessitates separate lines of shafting on machinery-floor for running the different sets of elevators, causes complications in spouting, and necessitates the employment of different gangs of men if shipping and transferring are done at the same time, and causes much delay and loss of time in the general management of the elevators.

The object of my invention is to overcome these difficulties, to reduce the cost of erecting and equipping such establishments, and to so arrange the elevators that the work of the house may be systematized and facilitated, thus reducing the running expenses.

The invention consists, principally, in locating both the shipping and receiving elevators alternately, with the garners or scales all in one line of bents throughout the building, so that both sets of elevators may be operated from a single line of shafting.

The invention also consists in locating the elevating apparatus in pairs or sets of two lengthwise throughout the building, and in locating the receiving-elevators immediately adjoining and co-operating with the shipping-elevators.

The invention also consists in carrying the lower end of the transfer or shipping elevators to a lower level than the receiving-elevators, and in arranging the receiving boots or hoppers below the railway-tracks at the ground-floor or basement of the house.

The invention finally consists of the construction, arrangement, and combination of parts, all as hereinafter described and claimed.

Reference is to be had to the accompanying drawings, forming a part of this specification, in which similar letters of reference indicate corresponding parts in all the figures.

Figure 1 is a transverse sectional elevation of the elevator-building, taken on the line *z z* of Fig. 2. Fig. 2 is central longitudinal sectional elevation on the line *y y* of Fig. 1. Fig. 3 is a sectional plan view on line *x x*, Fig. 1, and Fig. 4 is a similar view taken on the line *x' x'* of Fig. 1.

The building has, as shown in the drawings, the outlines of a modern grain-elevator, with a cupola running longitudinally with the body of the building. The cupola is divided into four floors, viz., machinery-floor A, garner-floor B, scale-floor C, and spouting-floor D, which latter is located immediately above the bin-floor E, in the body of the building.

Near the longitudinal center line of the structure are located a series of endless elevators of common construction, placed in pairs of one receiving-elevator, F, and one shipping-elevator, F'. These pairs of elevators each extend below the first or basement floor, H, and are placed, preferably, in the same tank, G, made of suitable material and water-tight. The tanks G are each made of two depths, forming tanks or hoppers *a a'*, for the receiving-elevator F and the shipping-elevator F', and the boots *a' a'* thereof, to obtain the proper incline or angle for transferring from the bins through the spout *b b'*. (Shown in Fig. 1.) The pairs of elevators F F' extend to the machinery-floor A, and are all operated from the same shaft, I, and a spout, *c*, is attached to the head of each elevator to discharge the grain into the receiving-garner J or the transfer or shipping-garner J', as the case may be. These garners J and J' each occupy a separate bent in the building, and are placed in pairs, side by side, along the central longitudinal line of the building, and each pair of garners J J' alternate throughout the length of the building with the pairs of elevators F F', so that every third bent contains a pair of elevators, while the two intervening bents are occupied each by a garner in such manner that the shipping-garner J' is

adjoining and below the shipping-elevator F' and the receiving-garner J adjoining the receiving-elevator F, which system is maintained throughout the cupola.

Below the garners J and J', respectively, are located on the scale-floor C the receiving-hopper scale L and the shipping-hopper scales L', which of course are arranged in pairs and in the same relation with the bents of the building and with the elevators F F' that the garners J J' bear, and by means of the short revolving spouts *d d* the scales may be registered with either of the stationary spouts *e* or *f*. The spouts *e* and *f* are each provided with a second revolving spout, *h*, which is adapted to connect with a spout, *i*, which may be shifted, as shown in dotted lines in Figs. 1 and 2, for directing grain from the scales to the bins M or connected with any of the pipes N for loading the cars O, as indicated in Fig. 1. The lower ends of the bins M may be connected with the transfer or shipping elevators F' by the spouts *b b'*, above referred to, while the shipping-spouts N connect with the car spouts *j* in a common manner. Four lines of cars may receive grain from the spouts N *j*, and the two center lines of cars convey the grain into the elevator, and from which the grain may be transferred by steam-shovels into the boots *a'* of the receiving-elevators F.

The steam-shovels may be operated from a central line of shafting, P. (Shown in Figs. 1 and 2.) The shaft I, which transmits motion to the elevators through the head-pulley *k* on counter-shafts *k'* and by belts or friction-pulleys or chain-wheels or otherwise, is driven from the ground-floor by belt *l*, coming from shaft Q, which transmits motion also to the shaft P. The distance between the pairs of elevators F F' is governed by the length of the railway-cars in use, as there must be the length of one car between each pair in such manner that all the cars in a line may be unloaded simultaneously.

In operation a line of loaded cars is run into the building and stopped so that each car-opening stands opposite to a receiving-elevator, F. The cars are then opened and the steam-shovels started and the grain shoveled from the cars into hoppers and boots *a a'* of the receiving-elevators, which elevators lift the grain to machinery-floor and discharge it into the receiving-garners J, from which it passes to the scales L, weighed, and, by means of the spouts above described, conveyed to the proper bins of the series supplied from that special or particular garner. Meanwhile, the shipping or transferring of grain from another lot of bins may take place through the spouts *b b'*, transferring-elevators F', garners J', scales L', pipes *d h i* and N *j* to any empty cars in the house. In this manner there is no complication of spouting, and both receiving and shipping may be conducted at the same time, and no loss of time or labor in shifting gangs of men, as is unavoidable under the old system, where the receiving-elevators are placed in one line, leaving the distance between each elevator nearly the length of a car, and locating the shipping or transferring elevators in one or more lines parallel to the receiving elevators, but in different lines of bents. The alternate arrangement in the same line of bents of the elevators and the receiving and shipping garners therefore greatly facilitates the management of the house, and besides enables a single line of shafting to be used for the elevators, both receiving and shipping or transferring. Furthermore, by this arrangement both the receiving and shipping elevator boots may be put in the same tank, thereby saving nearly one-half of the present cost of tanks, and the transfer or shipping boot *a'* being on a lower lever, the transfer-spouts *b'* may be passed below the railway-tracks and be stationary and yet out of the way, and the loading of the two elevators together causes only one bent to be obstructed, where by the old system two bents were occupied, and the locality of the elevators in pairs allows them all (both shipping and receiving) to be placed in the center line of the building alternately with the garners and scales, thus enabling the house to be spouted on first floor to the center from both sides to all the "cross-section" bents, while in the old system with two or more lines of elevators, each line only would be reached from the adjoining bents of the house. The shipping and receiving elevators being, as described, arranged in one line and together in pairs, allows one gang of men to attend to the pair of elevators, thus utilizing the time generally lost while one line of cars are being pulled out of the building, which occupies nearly as much time as unloading; and a large saving of time is also accomplished upon the cupola-floors, as the spouting, scale, and weigh men, as well as the machinery men, may do their work in far less time and with considerably less trouble than by the old system, every man attending only to one line of scales or machinery, whereas before he had two or three lines to attend to, and had to effect a passage between them.

It will be understood that although the drawings indicate ordinary bucket belt-elevators, the general system is applicable where any device for elevating the grain is used, and that each of the advantages pointed out may be attained separately by using one part of the system and omitting others.

Having thus fully described my invention, I claim as new and desire to secure by Letters Patent—

1. The grain-elevator comprising two garners, J J', placed side by side, the pair of elevators F F, placed together and contiguous to the garner J', and another pair of elevators F F', placed together and contiguous to the garner J, the said elevators and garners being all arranged in the same line, substantially as shown and described.

2. The grain-elevator comprising a pair of garners, J J', and a pair of scales, L L', ar-

ranged between two pairs of elevators, F F', substantially as described.

3. The grain-elevator comprising two scales, L L', placed side by side, the two pairs of elevators F F', arranged on either side of the scales, the stationary pipe *e*, connected to the scale L', the pipe *f*, connected to the scale L, and the separate pipes *d h*, substantially as described.

4. The grain-elevator comprising two elevators, F F', placed side by side and operated by the same line of shafting, the receiving-boot a^3, the shipping-boot a^4, both placed in and surrounded by a single hopper or tank, G, the boot a^4 being on a lower level than the boot a^3, substantially as and for the purposes set forth.

JOHN A. McLENNAN.

Witnesses:
ROBERT L. TATHAM.
ROBERT JEFFREY.

681

238-239

(No Model.) 2 Sheets—Sheet 1.

J. MUSGRAVE & J. P. CLARKE.

PORTABLE CHUTE.

No. 426,301. Patented Apr. 22, 1890.

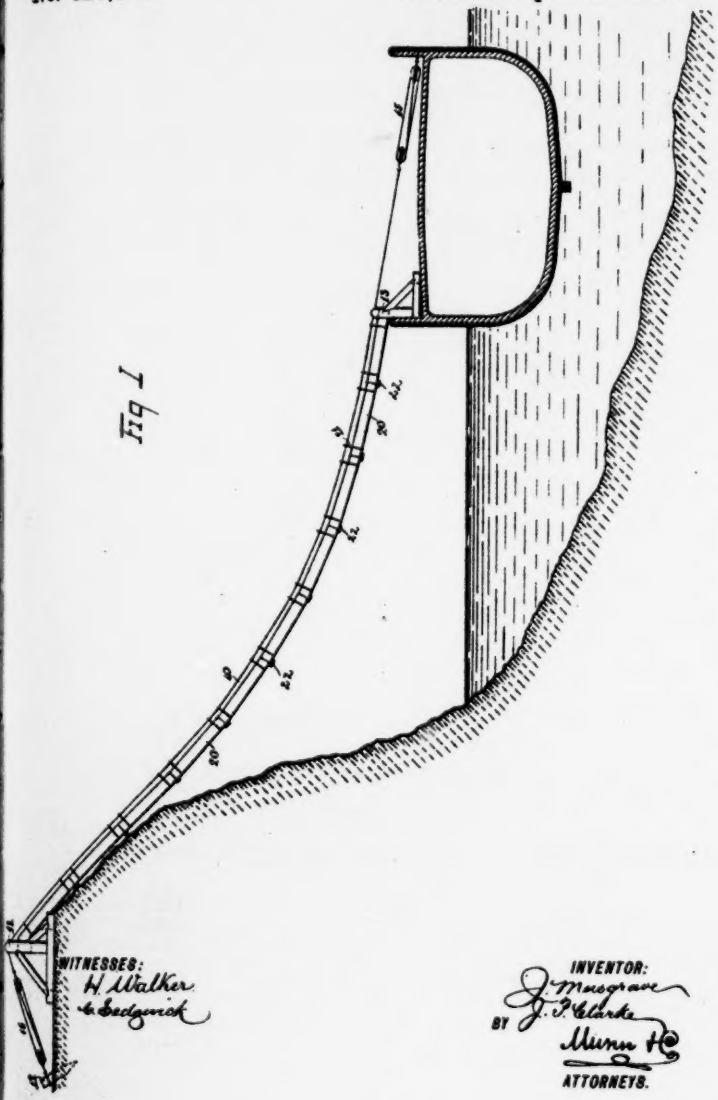


Fig 1

WITNESSES:
H. Walker
A. Sedgwick

INVENTOR:
J. Musgrave
J. P. Clarke
BY Munn & Co
ATTORNEYS.

682

240

(No Model.) 2 Sheets—Sheet 2.

J. MUSGRAVE & J. P. CLARKE.

PORTABLE CHUTE.

No. 426,301. Patented Apr. 22, 1890.

Fig 2

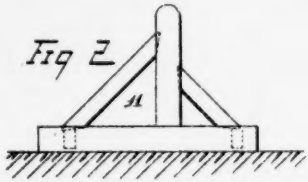


Fig 3

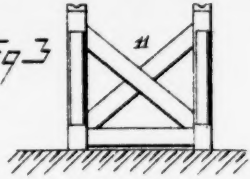


Fig 4

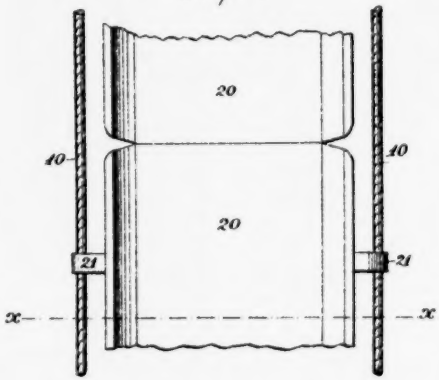


Fig 5

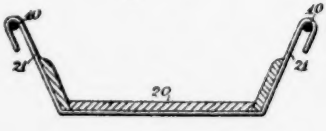
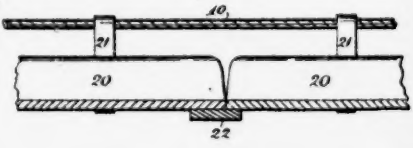


Fig 6



WITNESSES:
H. Walker
C. Bridgwick

INVENTOR:
J. Musgrave
J. P. Clarke
BY Munn & Co
ATTORNEYS.

683
241-243

UNITED STATES PATENT OFFICE.

JAMES MUSGRAVE AND JOSEPH PERCIVAL CLARKE, OF BUENOS AYRES, ARGENTINE REPUBLIC.

PORTABLE CHUTE.

SPECIFICATION forming part of Letters Patent No. 426,301, dated April 22, 1890.

Application filed September 18, 1889. Serial No. 324,298. (No model.) Patented in the Argentine Republic May 9, 1887, No. 586.

To all whom it may concern:

Be it known that we, JAMES MUSGRAVE and JOSEPH PERCIVAL CLARKE, both of Buenos Ayres, in the Argentine Republic, South America, have invented a new and Improved Portable Chute, of which the following is a full, clear, and exact description.

This invention relates to portable chutes, the object of the invention being to provide a chute which may be moved from place to place, and which when in use may be adjusted within certain limits to any desired pitch.

To the ends named the invention consists in the construction and arrangement of parts, all as will be hereinafter fully explained, and specifically pointed out in the claims.

Reference is to be had to the accompanying drawings, forming a part of this specification, in which similar figures of reference indicate corresponding parts in all the views.

Figure 1 is a side view of our improved portable chute, the same being represented as it appears when arranged in connection with a vessel that is to be loaded from the shore. Fig. 2 is a side view of the abutment employed in connection with the chute. Fig. 3 is an edge view of the abutment. Fig. 4 is a plan view of a portion of the chute. Fig. 5 is a cross-sectional view taken on line *x x* of Fig. 4; and Fig. 6 is a central longitudinal sectional view of a portion of the chute.

In constructing a chute such as the one forming the subject-matter of this application we provide supporting-cables 10, which are passed over any proper abutment—such as the one shown at 11—and connected to an anchorge 12, the cables being led downward to the vessel, there passing over an abutment, as 13, to be secured to any proper point upon the vessel's deck. In practice we prefer to connect tackles 15 to each end of the cables; but any proper means for adjusting the tension of the cables might be employed. The chute proper is made up of a series of troughs 20, which said troughs are provided with suspending-irons 21, the ends of said irons being bent to overlap the cables 10. The lower end of each chute section is provided with a transverse strip 22, upon which the upper end of the next section below rests.

From the construction above described it will be seen that we secure an exceedingly flexible chute, and one which may be easily moved from place to place. It will also be seen that the pitch of the chute may to a certain extent be regulated by varying the tension of the cables.

This chute may be adjusted so as to deliver the material with which the vessel is to be loaded to any one of the hatches, and that, too, without moving the vessel from its anchorage.

In certain cases the chute-sections might be suspended from a single cable, or if more than two cables were required additional cables might be employed without departing from the spirit of our invention, the essential feature of which is a flexible support and a series of chute-sections upheld thereby.

Having thus described our invention, we claim as new and desire to secure by Letters Patent—

The combination, with cables 10, of chute-sections 20, provided with transverse strips 22, and with hooked irons 21, said irons being arranged to engage the cables, substantially as described.

JAMES MUSGRAVE.
JOSEPH PERCIVAL CLARKE.

Witnesses to the signature of Jas. Musgrave:
W. S. MARTIN,
A. A. DUNCAN.
Witnesses to the signature of J. P. Clarke:
J. B. DAVIS,
WOODBINE PARISH.

684

244-245

(No Model.) 2 Sheets—Sheet 1.

J. SIMPSON.

GRAIN SPOUT.

No. 445,645. Patented Feb. 3, 1891.

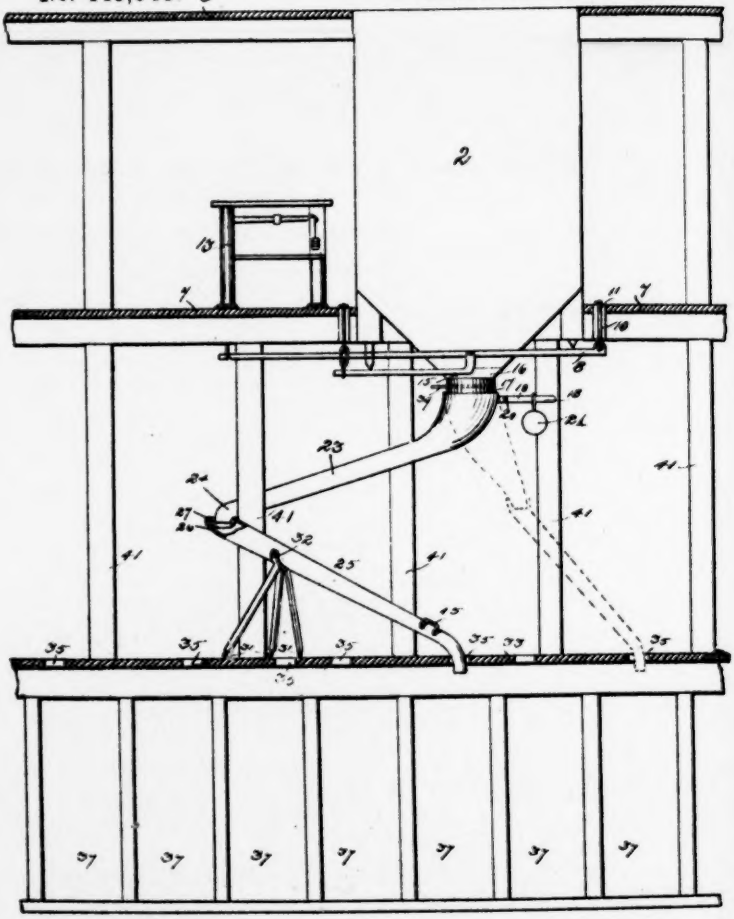


Fig. 1.

Witnesses.
O. E. Van Doren.
C. L. Hawley.

Inventor.
John Simpson
By Paul Mennin Attys.

(No Model.) 2 Sheets—Sheet 2.

J. SIMPSON.

GRAIN SPOUT.

No. 445,645. Patented Feb. 3, 1891.

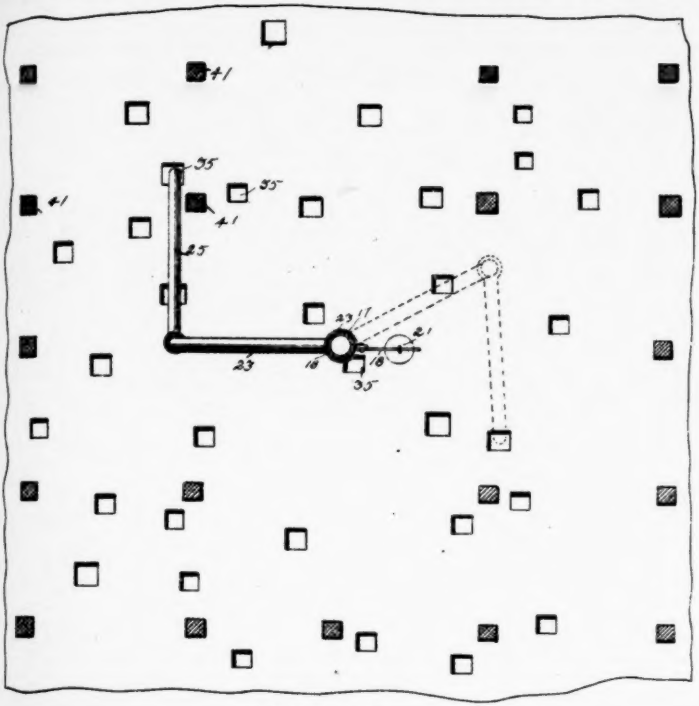


Fig. 2.

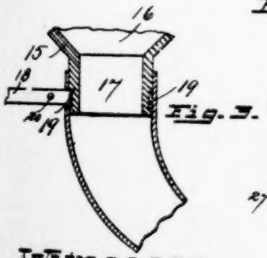


Fig. 3.



Fig. 5.

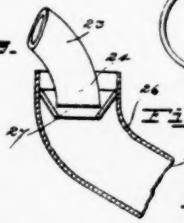


Fig. 4.

Witnesses
B. E. Van Dorens.
O. L. Hawley.

Inventor
John Simpson
By Paul & Brown Attys

686
247

UNITED STATES PATENT OFFICE.

JOHN SIMPSON, OF MINNEAPOLIS, MINNESOTA, ASSIGNOR OF ONE-HALF TO DIGHTON A. ROBINSON, OF SAME PLACE.

GRAIN-SPOUT.

SPECIFICATION forming part of Letters Patent No. 445,645, dated February 3, 1891.

Application filed February 15, 1890. Serial No. 340,655. (No model.)

To all whom it may concern:

Be it known that I, JOHN SIMPSON, of Minneapolis, in the county of Hennepin and State of Minnesota, have invented certain Improvements in Grain-Spouts, of which the following is a specification.

My invention relates to means for spouting or removing by gravity grain from one receptacle to another, and is particularly adaptable and useful in elevators for spouting grain from the scale-hopper to the various bins in the elevator; and the invention consists, generally, in two spouts or chutes, preferably made of metal, the upper one pivotally supported upon the bottom of the scale-hopper and adapted to be rotated about said hopper, and the lower one supported upon a suitable frame provided with rollers, so that it may be easily moved about the floor. The lower end of the upper spout is adapted to fit into the upper end of the lower spout, which may be rotated about said upper spout, thereby making a continuous conductor to any part of the floor within a circle described by the combined lengths of the two spouts. For convenience in weighing grain the upper spout is provided with a counterbalancing-weight to raise the upper from the lower spout, except when the grain is passing through it, all of which is hereinafter more fully described, and particularly pointed out in the claims.

In the accompanying drawings, forming a part of this specification, Figure 1 is a vertical section of a portion of an elevator provided with my improvements. Fig. 2 is a sectional view on line *x x* of Fig. 1. Fig. 3 is a detail showing the manner of connecting the upper spout to the hopper. Fig. 4 is a detail showing manner of constructing the parts of the two spouts where they come together. Fig. 5 is a detail plan view of the counterbalancing-weight and ring.

In the drawings, 2 represents a scale-hopper extending from the garner-floor 5 to the scale-floor 7 and supported upon suitable weighing-levers 8 and 9, supported by the bolts 10 upon the floor-timbers 11 and connected with the scales 13. Upon the bottom of the hopper is secured a suitable casting 15, having preferably the upper part 16 constructed flaring to fit onto the bottom of the hopper, and the lower part 17 cylindrical and provided with the annular groove 19. A bar of iron 18 is preferably provided bent in the form of a ring, so as to fit into the groove 19, and secured in place by means of the bolt 20, one end projecting out far enough to receive the weight 21. To the bar 18 is securely riveted the upper spout 23, so that when the band 18 is in place in the groove 19 it supports the spout 23. A lower spout 25 is provided, the upper end 26 of which is preferably made flaring or enlarged to receive the end 24 of the spout 23.

Arranged to fit in the enlarged end 26 of the spout 25 is a seat 27, preferably secured to the inclosing spout, the lower end being contracted so that its diameter is less than the diameter of the end 24 of the spout 23, thereby forming a seat for the spout 23 when in use. The spout 25 is preferably pivotally mounted upon a suitable track or frame 30, supported upon rollers 31, by means of the pivot 32, to facilitate its being moved from one place to another on the floor 33, which is provided with openings 35, leading into the bins 37 for the reception of the grain.

On the projecting end of the bar 18 is adjustably secured the weight 21, so as to counterbalance the weight of the spout 23, lifting the end 24 from contact with its seat 27 in the spout 25, so that it normally hangs suspended from the scale-hopper 2, the scales being adjusted to balance the weight of the hopper and the suspended spout.

A slide 39 is arranged in the casting 15 for opening and closing the outlet from the hopper into the spouts.

In operating the device, the grain being elevated into hopper 2 and weighed by the scales 13, the slide 39 is withdrawn, when the grain rushes into spout 23, its gravity overcoming the weight 21, thereby pressing the end 24 of the spout 23 firmly against the seat 27 in the enlarged end of the spout 25, the other end of the spout 25 being inserted in the opening 35, leading into the bin 37, into which it is desired to conduct the grain. When the grain is all out of the hopper 2, the spout 23 is automatically raised from contact with its seat 27 by means of the weight 21, but not out

of the spout 25. The spout 23 is adapted to be rotated about the bottom of the hopper 2 upon the bar 18, secured in the annular groove 19. The area traversed by the spout 23 when rotated should be free from posts or supporting-timbers 41; but outside this circle supporting-timbers may be placed when desired, as the construction and arrangement of the two spouts permit their being used in openings which may be directly behind the posts 41, as shown in Fig. 2. The dotted lines in both Figs. 1 and 2 show different positions into which the spouts may be swung. The end 24 of the spout 23 being rotated upon the inner casting in the spout 25, the dust from the grain is prevented from escaping from the spouts into the room, thereby avoiding a common nuisance and great annoyance.

A suitable handle 45 is secured to the spout 25, to take hold of in moving the spout from place to place.

I claim as my invention—

1. A grain-conductor comprising, in combination, an upper spout rotatively secured to a suitable support, an independent lower spout adapted to receive the loose end of the upper spout in any position in which it may be and capable of being rotated about said upper spout as a center, and an independent support mounted upon suitable rolls and supporting said lower spout, substantially as described.

2. The combination, with a scale-hopper, of a counterbalanced rotative spout 23, secured thereto.

3. The combination, with a scale-hopper for weighing grain, of a grain-conductor comprising two spouts, one secured to and adapted to rotate about said scale-hopper, the other adapted to receive the loose end of said first spout and to be rotated about it, and a counterbalancing-weight adapted to hold said first spout out of contact with said second spout when in its normal position, for the purpose specified.

4. The combination, with the scale-hopper, of a counterbalanced rotative spout 23, secured thereto, the independent movable spout 25, adapted to receive the loose end of the spout 23 in any position in which it may be, and a supporting-frame 30, provided with suitable rollers 32, substantially as described.

5. The combination, with the hopper 2, of the casting 15, secured thereto, provided with the annular groove 19, bar 18, secured in said groove and provided with weight 21, and the spout 23, secured to said bar, for the purpose specified.

6. The combination, with the spout 23, of the independent movable spout 25, having its upper end enlarged and adapted to receive the spout 23 in any position, the seat 27, secured to the said spout 25, the lower end of said seat being of less diameter than the end of the spout 23, for the purpose specified.

7. The combination, with a scale-hopper, of the casting 15, secured thereto, provided with the annular groove 19, bar 18, carrying weight 21, counterbalanced suspended spout 23, secured to said bar and adapted to rotate in said annular groove, and the spout 25, adapted to receive the loose end of the spout 23, substantially as described, and for the purpose specified.

8. The combination, with the hopper 2, of the casting 15, having groove 19, bar 18, weight 21, spouts 23 and 25, and seat 27, substantially as described, and for the purpose specified.

In testimony whereof I have hereunto set my hand this 3d day of February, 1890.

JOHN SIMPSON.

In presence of—
S. W. ROBERTS,
A. M. GASKILL.

(No Model.) 3 Sheets—Sheet 1.

E. D. MAYO.

DOUBLE SWIVEL GRAIN DISTRIBUTING SPOUT.

No. 464,101. Patented Dec. 1, 1891.

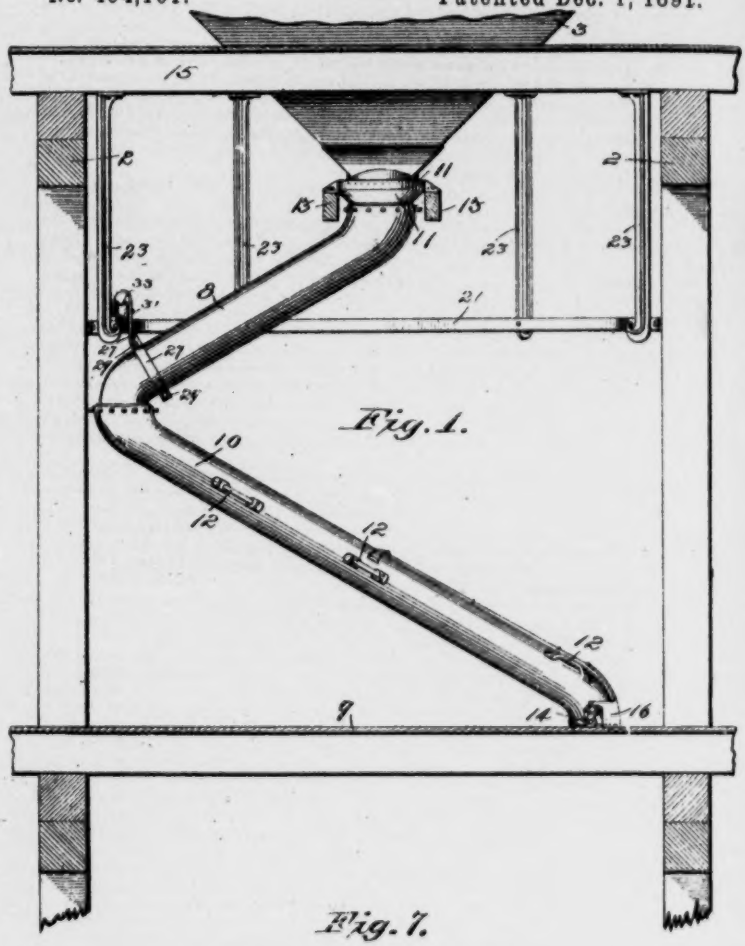


Fig. 1.

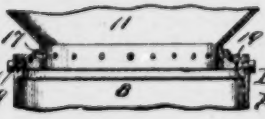


Fig. 7.

Witnesses,
C. E. Van Dorn,
T. J. Fyon.

Inventor,
Edward D. Mayo,
By Paul Synnestvedt
Attorney

689

252-253

(No Model.) 3 Sheets—Sheet 2.

E. D. MAYO.

DOUBLE SWIVEL GRAIN DISTRIBUTING SPOUT.

No. 464,101. Patented Dec. 1, 1891.

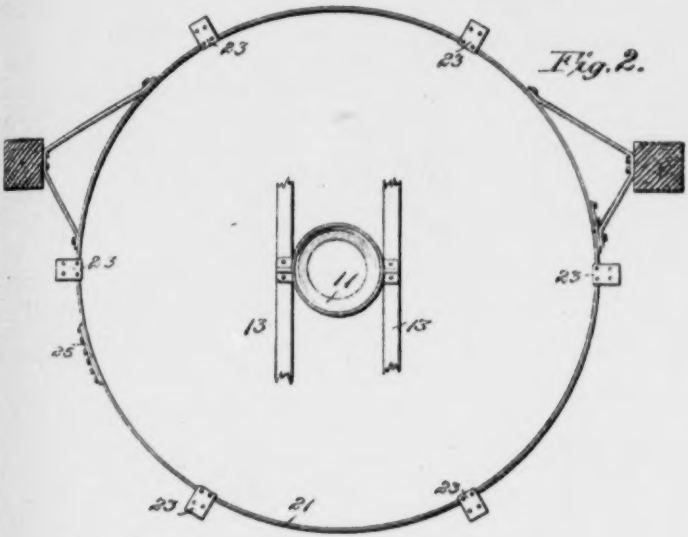


Fig. 2.

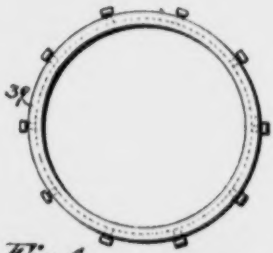
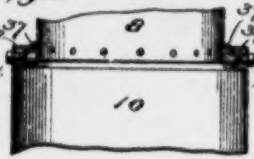


Fig. 3.

Fig. 4.



Witnesses.
C. E. Van Doren
F. A. Lyon.

Inventor,
Edward D. Mayo
By Paul & Merwin
Attorneys

690

254

(No Model.) 3 Sheets—Sheet 3.

E. D. MAYO.

DOUBLE SWIVEL GRAIN DISTRIBUTING SPOUT.

No. 464,101. Patented Dec. 1, 1891.

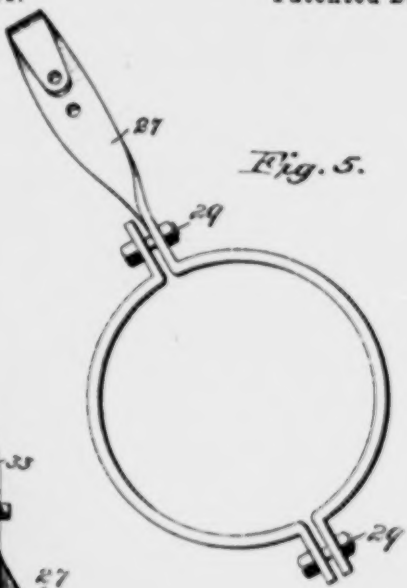


Fig. 5.

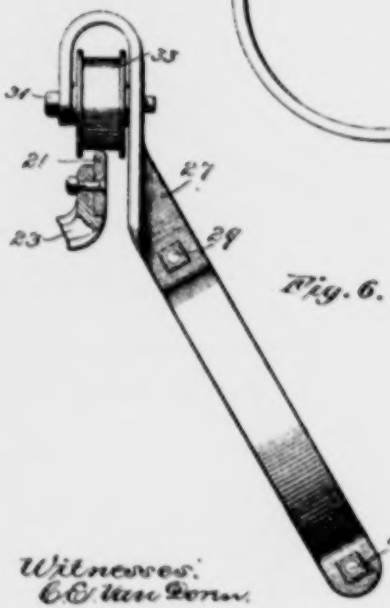


Fig. 6.

Witnesses:
C. C. Van Dorn.
F. J. Lyon

Inventor,
Edward D. Mayo,
By Paul & Brown Attys.

691.

255

UNITED STATES PATENT OFFICE.

EDWARD D. MAYO, OF MINNEAPOLIS, MINNESOTA, ASSIGNOR TO BARNETT & RECORD, OF SAME PLACE.

DOUBLE-SWIVEL GRAIN-DISTRIBUTING SPOUT.

SPECIFICATION forming part of Letters Patent No. 464,101, dated December 1, 1891.

Application filed August 15, 1891. Serial No. 402,755. (No model.)

To all whom it may concern:

Be it known that I, EDWARD D. MAYO, of Minneapolis, in the county of Hennepin and State of Minnesota, have invented certain new and useful Improvements in Double Swivel Grain-Distributing Spouts, of which the following is a specification.

This invention relates to improvements in grain-distributing spouts designed especially for use in grain-elevators; and the invention is particularly applicable for use in connection with a scale-hopper, and it is adapted to conduct the grain from the scale-hopper to any one of a series of grain-bins.

The invention consists, generally, in the construction and combination hereinafter described, and particularly pointed out in the claims.

In the accompanying drawings, forming a part of this specification, Figure 1 is a transverse vertical section of the spout-supporting device, with an elevation of a spout constructed in accordance with my invention. Fig. 2 is a plan view of the circular supporting-track. Figs. 3 and 4 are details of the lower spout-support, showing the manner of securing the lower spout to the upper. Figs. 5 and 6 are details of the clamp that is connected to the lower end of the upper spout-section, and showing the supporting-roller arranged thereon. Fig. 7 is a detail of the upper spout-support.

In the drawings, 2 2 represent the timbers or beams forming a portion of the elevator and providing means for supporting my improved spout.

3 represents the scale-hopper, which is of ordinary construction and supported in the usual way. Arranged below this hopper is the double distributing-spout, which is adapted to receive the grain from the scale-hopper and conduct it to any one of a series of openings in the floor 9. Below the scale-hopper is a ring or head 11, that is of circular form, and through which the grain passes as it leaves the hopper. This ring is arranged immediately below the hopper and is secured upon the horizontal beams or strips 13, that are in turn supported from the main beams 15, from which the circular track, hereinafter referred to, is supported, so that any settling or change of position of the beams 15 will cause an equal change of position of both ends of the upper spout-section, so as not to interfere with the free working of the spouts. The head or ring 11 is provided with a horizontal flange 17, and the upper spout-section 8 is provided with a horizontal flange 19, that overlaps and lies upon said flange 17. The flange 19 forms a support for the upper end of the spout-section 8, and this flange is adapted to turn freely upon the flange 17 of the ring 11, and it may also rise off from the flange 17 should such movement be necessary in the free operation of the spout. A circular track 21 is supported by hangers 23 from the beams 15, this track being concentric with the ring 11 and the upper end of the spout-section 8, but being arranged at a considerable distance below said ring 11. The ends of the track are secured together by means of a plate 25, whose upper edge is below the upper edge of the track, so as not to interfere with the movement of the wheel or truck, as hereinafter described. The hangers 23 are connected to the track 21 by having their lower ends upturned, as shown in Fig. 1, and bolted or riveted to the track 21, so as to leave the upper edge of the tracks projecting above said upturned end of the hanger. A clamp 27, consisting of two half-rings having the ends secured together by bolts 29, are arranged to clasp the lower end of the spout-section 8, and one of said rings is extended upward and then curved down and forms a bearing for the axle-pin 31 of the wheel or truck 33. This wheel 33 rests upon the track 21, and thereby supports the lower end of the spout-section 8, as shown in Fig. 1. This wheel is of greater width than the track 21, and as the flange 19 fits loosely upon the flange 17 of the ring 11 the spout-section 8 is capable of considerable lateral movement upon its supports, so as to allow for irregular portions of the track. The lower end of the upper spout-section is provided with an outwardly-projecting horizontal flange 37, corresponding to the horizontal flange upon the ring 11, and the upper end of the lower spout-section is provided with an inwardly-projecting horizontal flange 39, corresponding to the horizontal flange 19 at the upper spout-section. The lower spout-section 10 is preferably

692
256-257

provided with one or more handles 12, by means of which both of said spouts may be moved to any desired position. The lower end of the lower spout-section 10 is preferably provided with the supporting rolls or casters 14, that are secured to said spout, and are adapted to rest upon the floor and support the lower end of said spout-section while it is being moved from one position to another. The lower end of the section 10 is preferably curved downward and provided with the pivoted hood 16, which is adapted to drop down a short distance into an opening in the floor, as indicated by dotted lines in Fig. 1, and thereby preventing any of the grain from running out under the end of the spout. It will be seen that both of the spouts have a swinging movement upon the rings or flanges that support their upper ends. The upper sections may be turned upon the ring 11, and may also be given a slightly lateral movement. By swinging the upper spout-section its lower end is carried around, being supported upon the track 21, and thereby the upper end of the lower spout-section is carried with it. Then the lower spout-section may be turned about the lower end of the upper spout-section, and thereby the spout may be arranged to distribute the grain to any point within a large radius.

I claim as my invention—

1. The combination, with the supporting-ring 11, provided with a horizontal flange 17, of the upper spout-section 8, provided with a horizontal flange resting upon said flange 17, the horizontal flange 37 upon the lower end of said spout-section, and the lower spout-section 10, provided with the horizontal flange 39 at its upper end, resting upon the flange 37 upon said upper spout-section, whereby each of said spout-sections is capable of a rotative and a lateral movement upon its support.

2. The combination, with the ring 11, secured upon a stationary support, of a spout-section having its upper end rotatively secured upon said ring, a circular track concentric with said ring, a wheel or truck provided with a clamp that is secured to the lower end of said spout-section and rests upon said ring, and the lower spout-section having its upper end rotatably secured to the lower end of said first-named section, substantially as described.

3. The combination, with the beams 13, of the beams 13, supported therefrom, the ring 11, secured upon said beams 13, the hangers 23, secured upon the beams 13, the circular track 21, supported upon said hanger, and the inclined spout having its upper end rotatably secured upon said ring 11 and its lower end provided with a truck resting upon said track 21, and the lower spout-section having its upper end rotatably secured to the lower end of said first-named section, substantially as described.

4. The combination, with a suitable supporting-ring, of a spout-section having its upper end rotatably secured to said ring and its lower end suspended upon a track that is concentric with said ring, substantially as described.

In testimony whereof I have hereunto set my hand this 5th day of August, 1891.

EDWARD D. MAYO.

In presence of—
F. S. LYON,
C. E. VAN DOREN.

693

258-259

(No Model.) 2 Sheets—Sheet 1.

D. A. ROBINSON.

SWIVEL SPOUT FOR ELEVATORS.

No. 524,984. Patented Aug. 21, 1894.

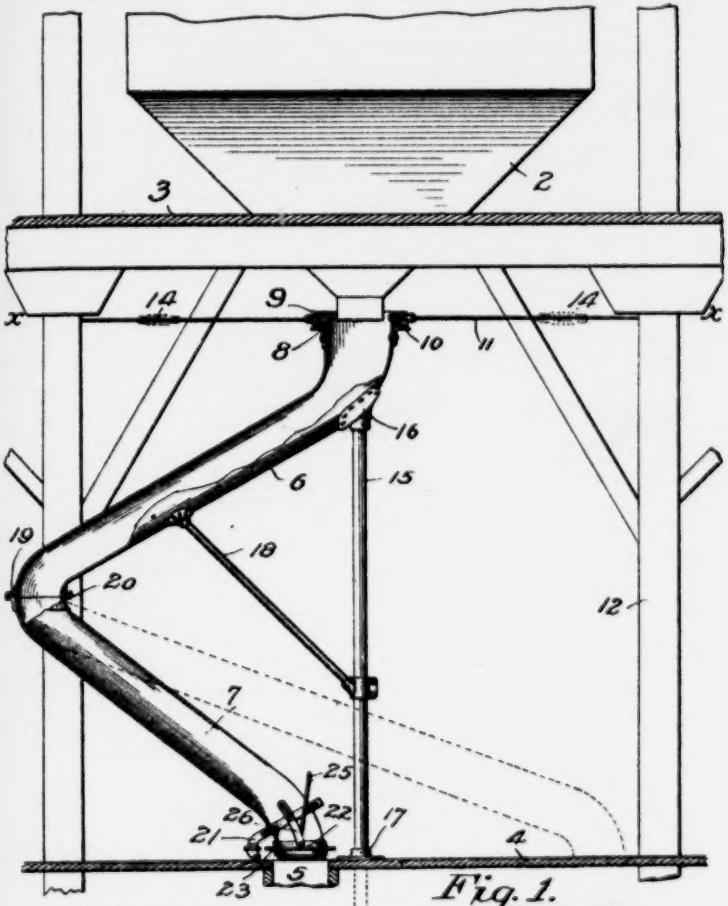


Fig. 1.

Witnesses.
Chas. E. Van Dorn.
F. S. Lyon

Inventor,
Dighton A. Robinson.
By Paul & Hawley
his Attorneys.

694

260

(No Model.) 2 Sheets—Sheet 2.

D. A. ROBINSON.

SWIVEL SPOUT FOR ELEVATORS.

No. 524,984. Patented Aug. 21, 1894.

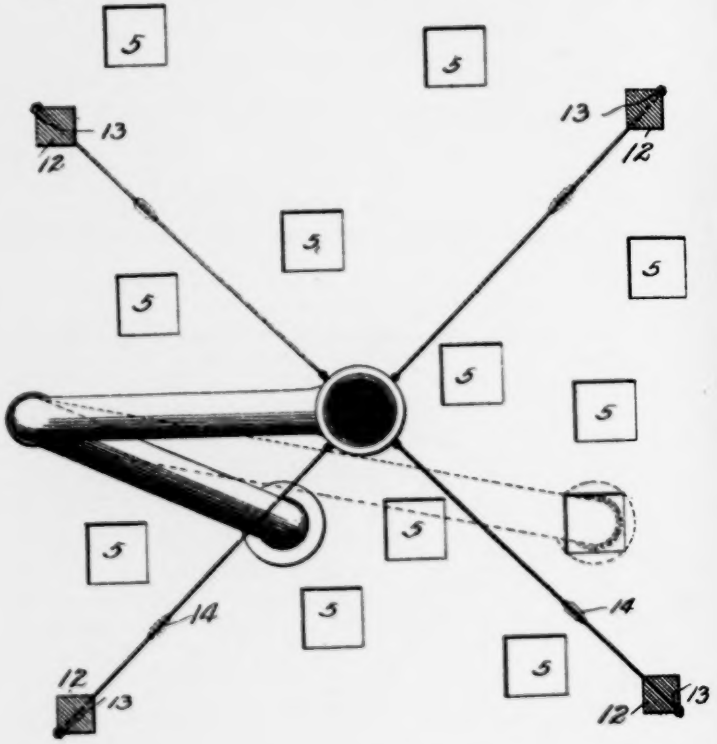


Fig. 2.

Witnesses.
Chas. E. Van Dorn,
W. B. Hyde.

Inventor,
Dighton A. Robinson.
By Paul & Hawley.
his Attorneys.

695

261

UNITED STATES PATENT OFFICE.

DIGHTON A. ROBINSON, OF MINNEAPOLIS, MINNESOTA.

SWIVEL-SPOUT FOR ELEVATORS.

SPECIFICATION forming part of Letters Patent No. 524,994, dated August 21, 1894.

Application filed October 30, 1893. Serial No. 489,548. (No model.)

To all whom it may concern:

Be it known that I, DIGHTON A. ROBINSON, of the city of Minneapolis, county of Hennepin, State of Minnesota, have invented certain new and useful Improvements in Swivel-Spouts for Elevators, of which the following is a specification.

This invention relates to swivel spouts for grain elevators, and particularly to spouts adapted for use between the weighing hoppers or garners of the upper floors and the storage bins beneath.

The particular object which I have in view is to provide improvements upon the spout shown and described in the patent to John Simpson, issued February 3, 1891, No. 445,645; and further, a spout which shall be considerably cheaper both to manufacture and to place in position and which will be more distinctly portable.

To this end my invention consists in the combination with an upper inclined section with a lower section swiveled thereon, and a central mast or shaft stepped upon the floor and supporting the upper section of the spout.

My invention consists further in the various constructions and combinations hereinafter described and particularly pointed out in the claims.

The invention will be more readily understood by reference to the accompanying drawings, in which—

Figure 1 is a vertical elevation of a spout embodying my invention, portions thereof being broken away to more clearly show its construction. Fig. 2 is a sectional plan view on the line x—x of Fig. 1.

As shown in the drawings, 2 represents a garner bin or weighing hopper, the lower end of which extends down through the floor 3, between which floor and the lower floor 4 provision is made for distributing the grain or other material from the hopper 2 to the several bins underlying the floor 4 and into which suitable spouts, extending from the floor holes 5, extend. The holes in the floor are arranged irregularly and it is therefore necessary that the distributing spouts have perfect freedom of movement in all their actions. The distributing spout is preferably made in two inclined sections 6 and 7. The upper section 6 is somewhat enlarged at the top to surround the lower end of the hopper 2 and carries the flanged ring 8. The upper end of the spout is held concentric of the hopper by a suitable ring 9 which is slipped down over the end of the ring 8 and rests upon the flange 10 thereof. The retaining ring or, as it may be termed, journal is itself held by any suitable means, such as the guy-rods or wires 11 which are adjustably secured in the posts or frame work 12. The ring is made adjustable laterally by means of nuts 13 on the outer ends of the guy-rods or by means of turn-buckles 14, as shown in dotted lines, and by the use of which the ring may be moved in any direction to compensate for settling of the building or change of construction. The ring, it will be seen, in no way aids in the support of the spout which is alone supported by a central mast or shaft 15, secured in the angle casting 16 on the bottom of the spout and concentric with the upper end thereof, while the lower end of the shaft is journaled in the step or block 17 provided on the floor. The brace 18 extending from the shaft to a lower point on the spout, holds the same at the proper angle. At the lower end of the part 6 I provide the flanged ring 19 which, through the channeled or grooved ring 20 secured upon the upper end of the lower part, supports the lower part of the spout. At the floor line the end of the distributing spout is supported upon the fixed cast 21, which permits the easy movement of the spout from one position to another.

To close the opening between the end of the spout and around the hole in the floor I employ the ring or collar 22, having the wide flange 23 and arranged to be dropped to the floor. For raising the ring I provide a ball 25, and to hold the ring in place upon the end of the spout I ordinarily provide curved links 26 having the slotted upper ends retained on pins in the sides of the spout. The lower section of the spout is preferably short enough to pass by the supporting mast, but if the floor holes are widely separated the longer section may be employed, as indicated by dotted lines in Fig. 1.

By simply providing a long bearing or a double bearing for the lower end of the shaft or mast it may be given sufficient rigidity to

696
262-263

render the use of the retaining or journal ring 9 unnecessary. Such a double bearing is shown by dotted lines in Fig. 1.

Having thus described my invention, I claim as new and desire to secure by Letters Patent—

1. The combination, with the inclined upper part of the spout, of a central vertical mast or shaft whereon the same is supported from beneath, and the lower inclined part of said spout having its upper end swiveled in the lower ends of said upper part, and a brace extending between said shaft and the upper part of the spout, to support the same and therewith the lower part of the spout, all as and for the purpose specified.

2. The combination, with the upper inclined part of the spout, of the lower part also inclined and swiveled thereon, a central mast or shaft supporting said upper part from beneath, and a stationary ring wherein the upper end of the spout is held against lateral movement, substantially as described.

3. The combination, with the upper inclined part of the spout, of the lower part also inclined and swiveled thereon, a central mast or shaft supporting said upper part from beneath, a stationary ring wherein the upper end of the spout is held against lateral movement, and guys extending from said ring to suitable fastenings, substantially as described.

In testimony whereof I have hereunto set my hand this 25th day of September, 1893.

DIGHTON A. ROBINSON.

In presence of—
F. S. LYON,
M. E. GOOLEY.

697

264–265

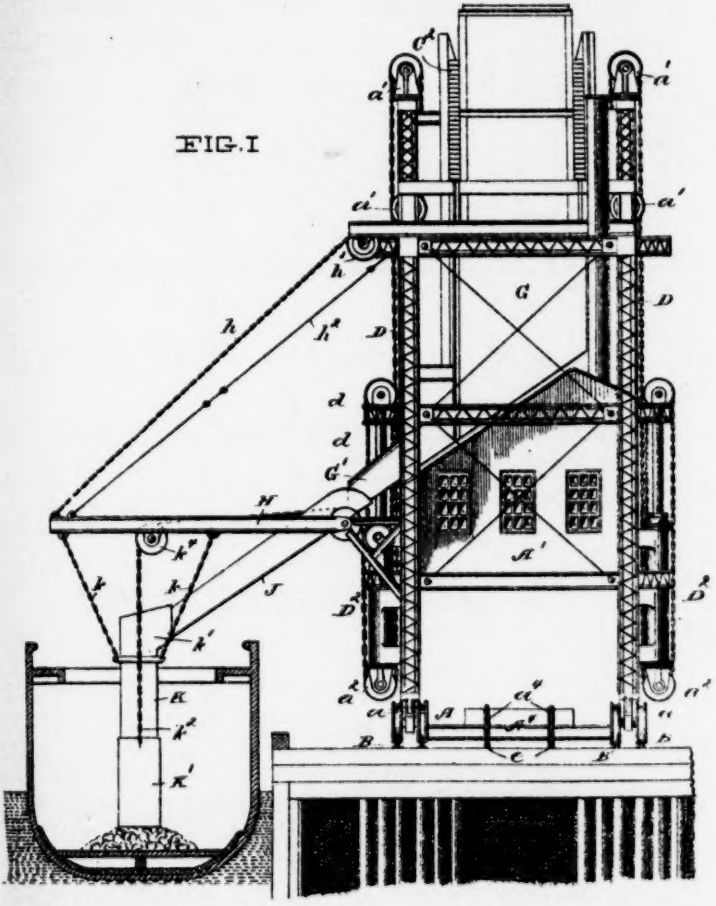
(No Model.) 5 Sheets—Sheet 1.

P. RASCH.

APPARATUS FOR HOISTING AND UNLOADING RAILWAY CARS.

No. 556,371. Patented Mar. 17, 1896.

FIG. I



WITNESSES,

J. C. Turner

W. Fischer

INVENTOR,

Peter Rasch

By Hall & Fay

Atty's.

698

266–267

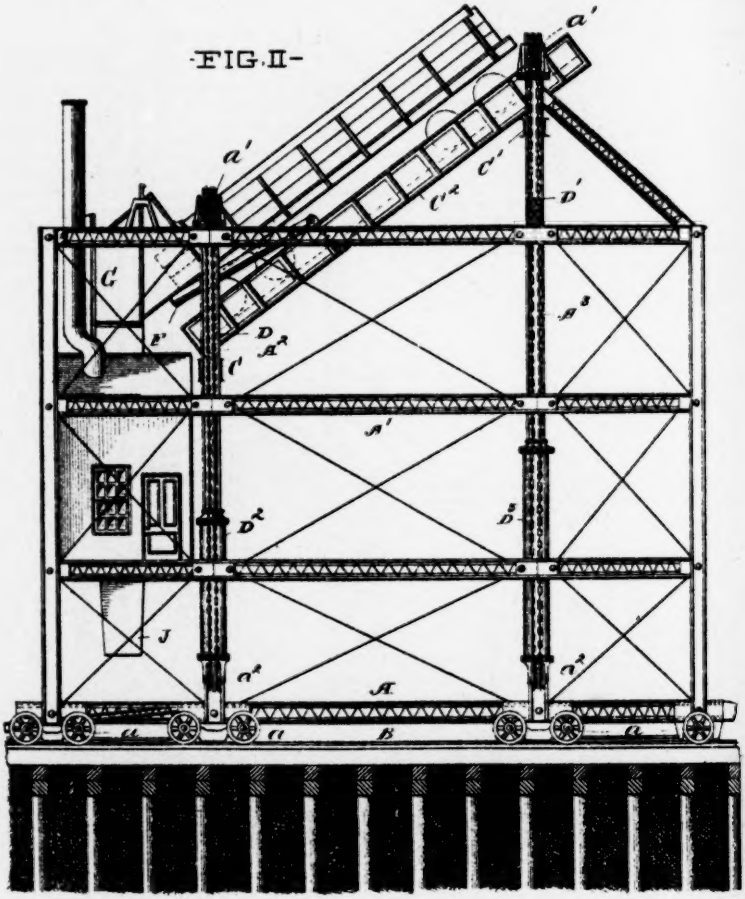
(No Model.) 5 Sheets—Sheet 2.

P. RASCH.

APPARATUS FOR HOISTING AND UNLOADING RAILWAY CARS.

No. 556,371. Patented Mar. 17, 1896.

FIG. II.



WITNESSES,
J. C. Turner
Wm. Lecher

INVENTOR,
Peter Rasch
By Hall & Fay
Attys.

699

268-269

(No Model.) 5 Sheets—Sheet 3.

P. RASCH.

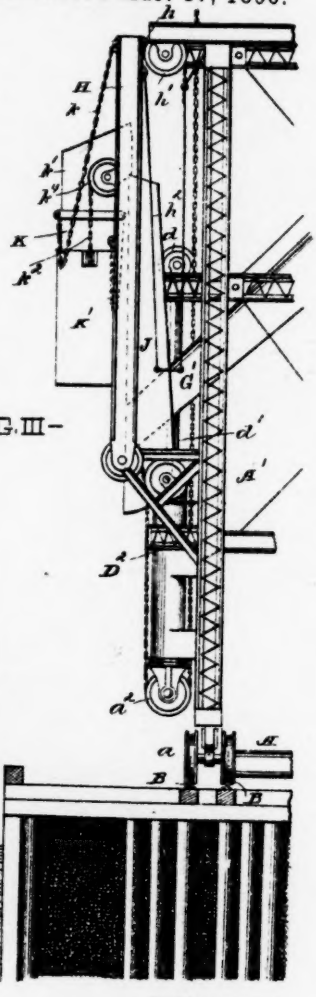
APPARATUS FOR HOISTING AND UNLOADING RAILWAY CARS.

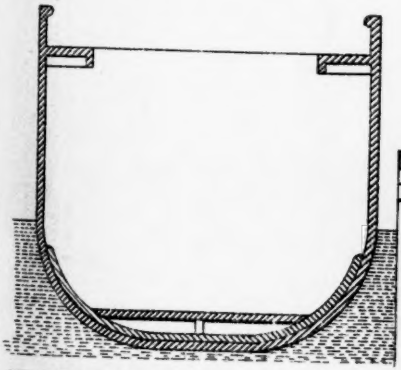
No. 556,371. Patented Mar. 17, 1896.

-FIG. IV-



-FIG. III-





WITNESSES,
H. C. Turner
Wm. Jecker

INVENTOR,
Peter Rasch
By Hall & Fay
Attys.

760

270–271

(No Model.) 5 Sheets—Sheet 4.

P. RASCH.

APPARATUS FOR HOISTING AND UNLOADING RAILWAY CARS.

No. 556,371. Patented Mar. 17, 1896.

FIG. X.

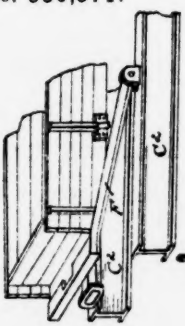


FIG. VI

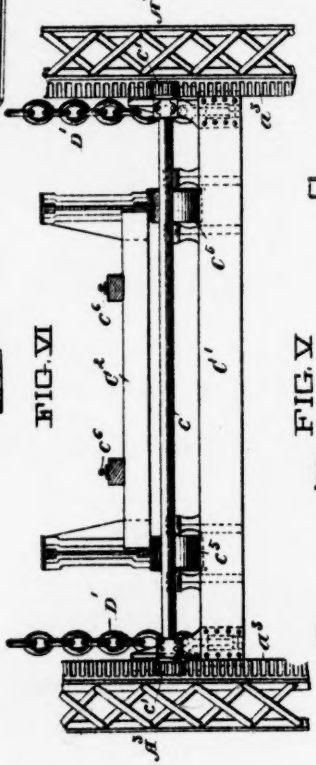


FIG. V

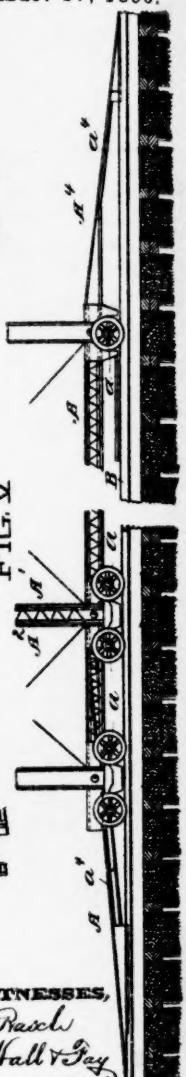
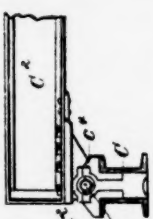


FIG. VII



WITNESSES,
J. C. Turner
Wm. Secker

WITNESSES,
Peter Rasch
By Hall & Fay
Atty's.

701
272

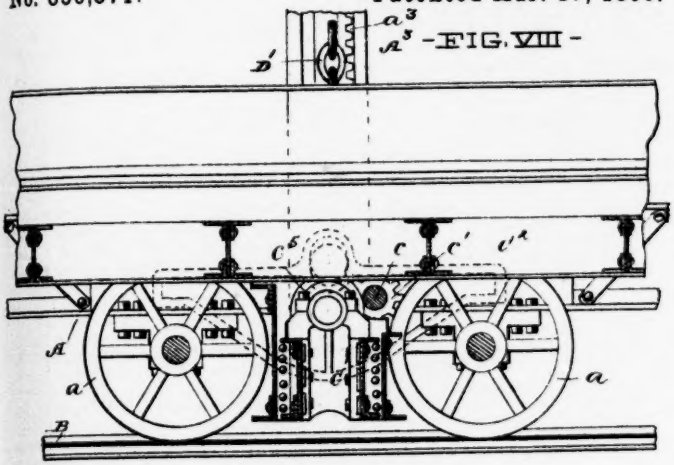
(No Model.) 5 Sheets—Sheet 5.

P. RASCH.

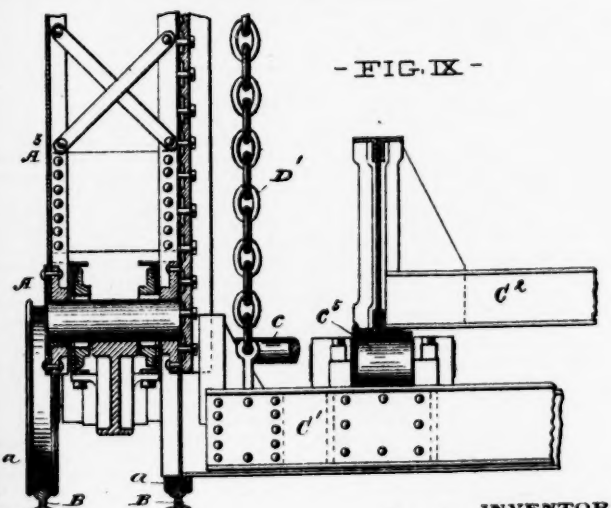
APPARATUS FOR HOISTING AND UNLOADING RAILWAY CARS.

No. 556,371. Patented Mar. 17, 1896.

- FIG. VIII -



- FIG. IX -



WITNESSES:
J. C. Turner
Wm. F. Lechner

INVENTOR.
Peter Rasch
By Hall & Fay
Attys.

702

273

UNITED STATES PATENT OFFICE.

PETER RASCH, OF CLEVELAND, OHIO.

APPARATUS FOR HOISTING AND UNLOADING RAILWAY-CARS.

SPECIFICATION forming part of Letters Patent No. 556,371, dated March 17, 1896.

Application filed February 8, 1895. Serial No. 537,696. (No model.)

To all whom it may concern:

Be it known that I, PETER RASCH, a subject of the King of Denmark, and a resident of Cleveland, county of Cuyahoga, and State of Ohio, have invented certain new and useful Improvements in Apparatus for Hoisting and Unloading Railway-Cars, of which the following is a specification, the principle of the invention being herein explained, and the best mode in which I have contemplated applying that principle so as to distinguish it from other inventions.

The annexed drawings and the following description set forth in detail one mechanical form embodying the invention, such detail construction being but one of various mechanical forms in which the principle of the invention may be used.

In said annexed drawings, Figure I represents an end elevation of my improved apparatus for hoisting and unloading railway-cars, showing the apparatus in position at the edge of a wharf with a vessel loading at the wharf; Fig. II, a side elevation of the apparatus; Fig. III, an end elevation of as much of the apparatus as will illustrate the raised position of the chute and its jib; Fig. IV, a front view of the telescoping tubular portion of the chute; Fig. V, a side elevation of so much of the wheeled base of the apparatus as will illustrate the inclined approaches; Fig. VI, a detail view of the mechanism for guiding each end of the elevator-platform and of the mechanism for permitting longitudinal movement at one end of such platform; Fig. VII, a detail view of the hinge-support for the other end of the platform; Fig. VIII, an enlarged detail view of a portion of the platform, its rolling support, and of one transverse beam; Fig. IX, a transverse section of the same parts, said two latter figures showing the platform in its lowermost position; and Fig. X, a perspective view of the end of a car, illustrating the application of a hinged stop for the same.

The base A of an upright structure A′ is provided with wheels *a*, which travel upon tracks B, preferably laid parallel with the edge of the wharf. The upright frame structure has vertical guides A^3 and A^3, by means of which the car elevating and tilting support is guided. Said support consists of two transverse beams C and C′ and a platform C^2, supported upon said beams. Chains D and D′ are secured to the beams, pass over pulleys *a*′ at the upper ends of the vertical guides, the pulleys upon the guides A^3 being above the pulleys upon guides A^3, under pulleys a^2 at the lower ends of said guides, over pulleys *d* upon the piston-rods *d*′ of hydrostatic cylinders D^2 and D^2, and are then secured to the frame structure. The cylinders are preferably secured to the outer sides of the vertical guides.

For the purpose of insuring absolute evenness in the upward or downward motion of each beam a shaft *c* is journaled upon the beam and parallel with the same, and said shaft has pinions *c*′ upon its ends, which engage racks a^3 upon the vertical guides. The platform of the elevating and tilting support is hinged to one beam C by means of cars c^2, through which passes a shaft c^3, which rocks in bearings c^4 upon the beam. The other end of the platform rests upon rollers c^5, which are journaled upon the top of the other beam C′, so that the platform may have a longitudinally-movable support when the beam is raised, while the beam under the other end remains stationary.

Inclined approaches A^4 are provided at each end of the frame structure and have rails a^4, which meet both ends of rails c^6 upon the platform. The lower ends of the inclined rails are so constructed that they may bear upon the tops of the rails *e* of the railroad track or siding, upon which the cars to be elevated and dumped run. A hinged stop F upon the platform serves to prevent longitudinal movement of the car when the latter and the platform are tilted, the stop engaging the draw-head and bumpers at the end of the car.

A rigid hopper G is constructed at one end of the frame structure and has its bottom inclined toward the front of the wharf, where it extends into an inclined chute G′. A jib H is pivoted to the frame structure at the lower end of the chute, and a chute J is hinged to the lower end of the rigid chute, so as to form a continuation for said latter chute. A cylindrical spout K is supported by means of chains *k* from the jib and has an elbow *k*′ at its upper end, into which the lower end

of the hinged chute projects. A cylindrical spout K′ telescopes upon the upper spout, and said spouts have chains k^2 and k^3 secured to them and carried over pulleys k^4 upon the jib to the structure, so that the spout-sections may be raised or lowered by said chains. One or more chains h is secured to the jib and passes over a pulley or pulleys h' at the top of the frame structure, so that the jib may be raised to swing the hinged chute and the telescoping spout-sections up against the side of the structure and out of the way of vessels in front of the wharf. The jib is supported in its lowered position by a linked guy-rod h^2.

In practice the wheeled frame structure is moved upon its track until it arrives opposite the place where the discharge of the contents of the cars to be unloaded is to be made. In the illustrated case the structure is opposite the hatchway of a vessel lying alongside of the wharf. The car to be unloaded is drawn up at one of the inclined approaches onto the elevator-platform. When the car has been drawn onto the platform, the actuating fluid—steam, air or water under pressure—is admitted into the hydrostatic cylinders, and the elevating-support, with the car upon it, is raised along its vertical guides. When the support arrives at the point which brings one end of the car above the hopper of the frame structure, the hoisting apparatus for that end of the support is stopped, while the other end of the support continues to rise. The car has been secured by means of the end stop, and the end-gate of the car has been opened or removed, so that the contents of the car will be emptied into the hopper, chutes, and spout. The hinged end of the platform remains stationary during the endwise tilting of the car, while the rollers upon the beam which continues to rise move under the platform and allow that end of the latter to be raised.

As the contents of the car fall into the hopper, chutes and spouts the latter will become filled, as the lower end of the lowermost spout-section rests upon the bottom of the vessel or upon the top of the cargo already in the hold. When now the lower spout-section is raised by its chains, the contents of said section may slowly escape under the edge of the section. The upper section may be similarly raised to allow its contents to escape if the pile in the hold of the vessel reaches a height above the lower edge of the upper spout-section. By this telescoping-spout arrangement the contents of the car may gently slide into the hold of the vessel, which is a matter of great importance in the use of an apparatus of this character for unloading coal from cars, as, if the coal has a free slide from the car down to the bottom of the vessel, the coal will be so much broken as to contain too much slack and dust and to deteriorate in value far beyond the saving attained by the rapid unloading of the car. This feature of breakage has been largely instrumental in preventing the employment of otherwise practical car-unloading apparatus for unloading coal, which is the article for which these devices are most desired and the handling of which forms the greatest item of cost.

As the hoisting mechanism of my apparatus is arranged above and at the sides of the bottom of the frame structure, the car-supporting platform may be lowered to a short distance above the surface of the ground or wharf upon which the frame structure stands, whereby the necessity for drawing the car up a steep incline is avoided.

The structure has preferably two inclined approaches, one at each end, so that after a car has been raised, dumped, and again lowered one car may be drawn upon one incline onto the platform, while the preceding car may run down the other incline off from the platform.

By mounting the apparatus upon wheels the apparatus may be moved to be exactly opposite the point where the discharge of the car-load is to be delivered.

When the apparatus is not in use, the jib, chutes and spout may be raised out of the way of vessels passing along the front of the wharf.

Other modes of applying the principle of my invention may be employed for the mode herein explained. Change may therefore be made as regards the mechanism thus disclosed, provided the principles of construction set forth respectively in the following claims are employed.

I therefore particularly point out and distinctly claim as my invention—

1. In apparatus for hoisting and unloading railway-cars, the combination of a platform upon which a railway-car may be supported, a support to which one end of the platform is hinged, means for raising and lowering said support, another support upon which the other end of the platform is supported and may move longitudinally, and means for raising and lowering said latter support—said two sets of raising and lowering means acting separately and independently of each other, substantially as set forth.

2. In apparatus for hoisting and unloading railway-cars, the combination of a platform upon which a railway-car may be supported, a support to which one end of the platform is hinged, means for raising and lowering said support, another support having a roller upon which the other end of the platform may move longitudinally, and means for raising and lowering said latter support, said two sets of raising and lowering means acting separately and independently of each other, substantially as set forth.

3. In apparatus for hoisting and unloading railway-cars, the combination of an upright frame structure having vertical guides, a beam transverse to said structure and guided by one set of the guides, a transverse beam guided by another set of guides, means for separately raising and lowering each of said

beams, and a platform upon which a railway-car may be supported and having one end hinged to one beam and having rolling support for its other end upon the other beam, substantially as set forth.

4. In apparatus for hoisting and unloading railway-cars, the combination of an upright structure having pairs of vertical guides, a transverse beam guided by one pair of guides, another transverse beam guided by another pair of guides and having a roller upon its upper side, means for separately raising and lowering each of said beams, and a platform upon which a railway-car may be supported and having one end hinged to the first-mentioned beam and having its other end resting upon the roller on the second beam, substantially as set forth.

5. In apparatus for hoisting and unloading railway-cars, the combination of an upright structure having two pairs of vertical guides and inclined approaches at its ends, a transverse beam guided by one pair of guides, another transverse beam guided by the other pair of guides and having a roller upon its upper side, a platform hinged at one end to the first beam and having its other end resting upon the roller of the other beam and having its end registering with the elevated ends of the approaches when the beams are in their lowered positions, hoisting-chains attached to the ends of the beams and carried over guide-pulleys at the upper ends of the vertical guides, and hydrostatic cylinders having their piston-rods connected to operate said chains, substantially as set forth.

6. In apparatus for hoisting and unloading railway-cars, the combination of a base-frame mounted on wheels, two pairs of vertical guides extending from said base-frame, inclined approaches at the ends of the base-frame, transverse beams having their ends guided in the guides, a platform supported by said beams, hoisting-chains attached to said beams and guided over the upper ends of the vertical guides, and hydrostatic cylinders secured upon the outer sides of the vertical guides and having their piston-rods connected to operate the hoisting-chains, substantially as set forth.

In testimony that I claim the foregoing to be my invention I have hereunto set my hand this 5th day of February, A. D. 1885.

PETER RASCH.

Witnesses:
WM. SECHER,
DAVID T. DAVIES.

705

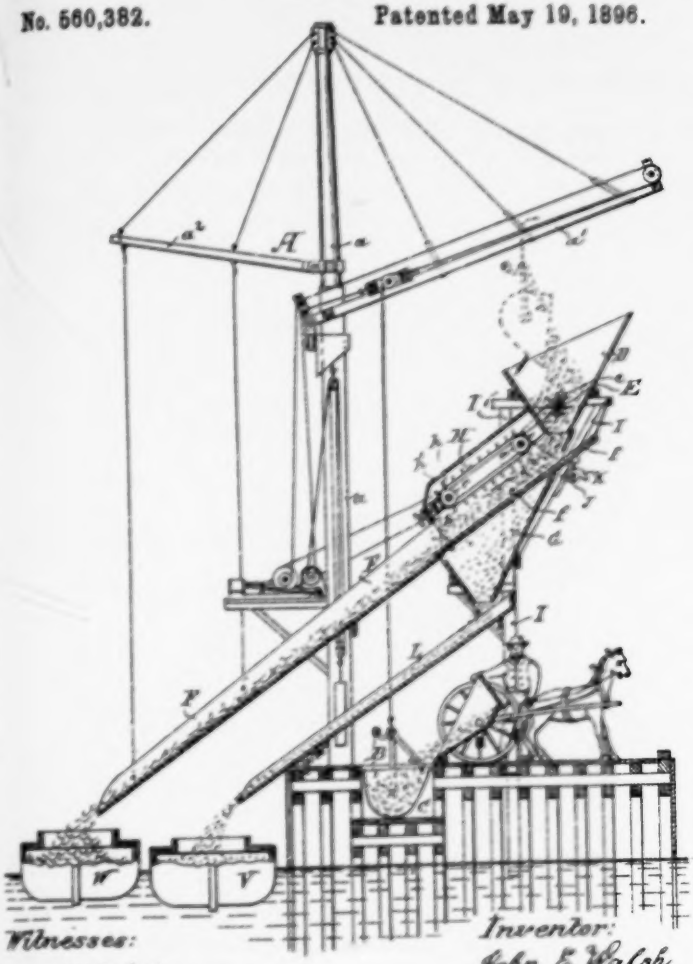
278

(No Model.)

J. E. WALSH.

COMBINED APPARATUS FOR SEPARATING AND HANDLING REFUSE OF CITIES.

No. 560,382. Patented May 19, 1896.



Witnesses:

Philip J. Ryan.

Peter Rogers.

Inventor:

John E. Walsh

per Charles Rattigan

his Attorney.

706

279-281

UNITED STATES PATENT OFFICE.

JOHN E. WALSH, OF NEW YORK, N. Y.

COMBINED APPARATUS FOR SEPARATING AND HANDLING REFUSE OF CITIES.

SPECIFICATION forming part of Letters Patent No. 560,382, dated May 19, 1896.

Application filed December 23, 1895. Serial No. 573,166. (No model.)

To all whom it may concern:

Be it known that I, JOHN E. WALSH, a citizen of the United States, and a resident of New York, in the county of New York and State of New York, have invented certain new and useful Improvements in a Combined Apparatus for Handling and Separating the Refuse of Cities, of which the following is a specification.

My invention relates to improvements in apparatus by means of which the substances contained in the refuse of cities are separated and handled preparatory to transporting them; and my invention consists in a combination of devices by which the ashes contained in the refuse can be separated from the other matter contained therein, consisting principally of garbage and the like, and each part can be loaded separately into one of two or more vessels lying beside each other.

The figure shown in the accompanying drawing represents a side elevation, partially in section, of the improved apparatus for handling and separating the refuse of cities, the latter standing in front and the crane standing closely behind it.

The mast *a* of the crane A is secured near one side or end of a dock and provided with two or more booms a' a^2, one of which carries the chute leading from the separator to the hatches of vessels to be loaded, while the other serves to raise the bucket B from a cavity C, provided in the dock near the socket of the mast, after it has been loaded with refuse, and to carry it in the customary manner over the upper hopper D, into which the load is discharged.

The hopper D is provided near its discharge-opening with a rotating stirrer E, mounted upon a horizontal shaft *e*, to facilitate the discharge and prevent the clogging of the opening. From the hopper D the refuse matter drops upon the bottom of an inclined trough or chute F, the outer end of which leads to the hatch of the outer vessel W and is supported from the outer boom a^2 of the crane, while the upper end of the chute is provided with a perforated rocking bottom *f*, which permits the ashes to drop into the lower hopper G, while the garbage and larger matter will pass down the chute F into the hold of the outer vessel W. To prevent clogging at the point of discharge from the hopper D, a continuous belt H is mounted upon adjustable rollers *r*, secured to the stationary frame I, supporting the hoppers, in such a position that its lower section travels parallel to the bottom of the chute F and in a downward direction. This belt H is provided along its entire length with projecting prongs *h*, which while the belt is traveling along will touch the upper layers of the refuse sliding down the chute F and will assist to separate the garbage from the ashes, the speed of the belt being so regulated as to give the best practical results. To prevent the arising of dust, a cover *h'* is mounted over the endless belt H and the rocking bottom *f*, as shown in the drawing. To secure a thorough sifting and separation of the ashes, a shaft J, carrying a cam K, is mounted upon the frame I and will, when revolved by means of a belt and pulley from an engine, vibrate the perforated bottom *f*. The thus separated ashes will pass through the hopper G and will slide along the chute L to the vessel V placed nearer to the dock. All the moving parts of the apparatus are actuated by means of pulleys and belts from an engine, preferably mounted upon the crane A. The garbage and ashes will thus be separated and loaded into separate vessels as soon as received and dumped at the dock, saving considerable time and labor. Both chutes F and L are made adjustable.

Having thus described my invention, what I claim, and desire to secure by Letters Patent, is—

1. The combination of a hopper D, a stirrer E, a chute F, a perforated rocking bottom *f*, a shaft J, a cam K, an endless barbed belt H, a hopper G, chute L, frame I, crane A, and means for operating the moving parts as and for the purposes herein shown and described.

2. The combination of a hopper D, and a stirrer E with a chute F having a perforated rocking bottom, an endless barbed belt H, and means for supporting and operating the parts, as and for the purposes herein shown and set forth.

Signed at New York, in the county of New York and State of New York, this 21st day of December, A. D. 1895.

JOHN E. WALSH.

Witnesses:
JULIUS HAAGER,
H. C. MECKLEM, Jr.

(No Model.)

C. E. BIRD.

ADJUSTABLE SWIVELED GRAIN SPOUT.

No. 582,598. Patented May 11, 1897.

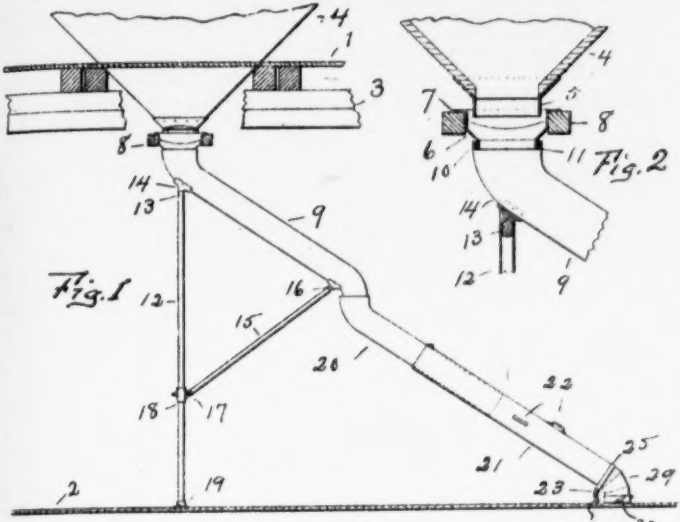


Fig. 1

Fig. 2

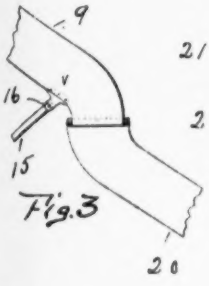


Fig. 3

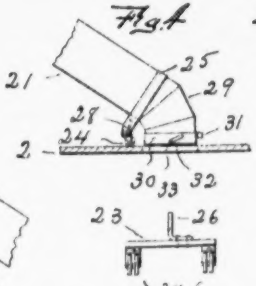


Fig. 4

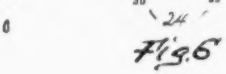


Fig. 6

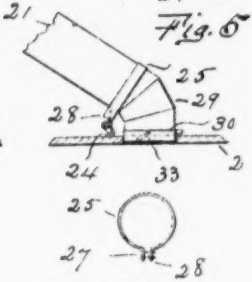


Fig. 6

Fig. 7

Witnesses
R. Blume
Carolyn Tolchin

Inventor
Charles E. Bird
By Attorney
H. H. Gunckel

UNITED STATES PATENT OFFICE.

CHARLES E. BIRD, OF MINNEAPOLIS, *MINNESOTA*, ASSIGNOR OF ONE-HALF TO HONSTAIN BROS., OF SAME PLACE.

ADJUSTABLE SWIVELED GRAIN-SPOUT.

SPECIFICATION forming part of Letters Patent No. 582,598, dated May 11, 1897.

Application filed February 11, 1897. Serial No. 622,959. (No model.)

To all whom it may concern:

Be it known that I, CHARLES E. BIRD, a citizen of the United States, residing in the city of Minneapolis, county of Hennepin, and State of Minnesota, have invented a certain new and useful Improvement in Adjustable Swiveled Grain-Spouts, of which the following is a specification.

My invention relates to the class of adjustable spouts that is used in conveying grain from weighing-hoppers to the openings of a series of conveying-spouts arranged in a floor below at varying distances from the hopper; and the object of the invention is to render the distributing-spout, to which the invention pertains, more readily available for adjustment in respect to its extension or contraction and its movement in arcs, for the purpose of connecting the hopper with the selected bin-spout of the series.

In a general way the invention may be said to comprise a spout composed of sections swiveled together, the lower being preferably formed of telescoping portions, while the upper is connected to the funnel of the hopper in a manner that permits it to be revolved, and a vertical support for the latter member having a connection therewith adapted to permit the necessary up-and-down movement of the spout, and a hinged brace connecting the vertical support to the upper spout member, and the lower end of the lower member being supported by a carriage on casters permitting it to be moved from place to place, and an adjustable hood provided at the bottom for entering the openings in the floor.

The improvements referred to are illustrated in the accompanying drawings, in which—

Figure 1 is a side elevation of the devices, showing also a portion of the supporting timbers, floors, &c. Fig. 2 is an enlarged detail view of the swiveled connection between the funnel of the hopper, the upper portion of the spout, and the hinged connection between the latter and its supporting-staff. Fig. 3 shows in elevation the manner of connecting the upper with the lower spout-section and also the connection of the brace-bar with the spout. Figs. 4 and 5 show, respectively, the positions of the adjustable lower end of the lower spout-section, the former showing its position above the floor-opening and the latter its operative position; and Figs. 6 and 7 show details of the carriage devices by which the lower end of the spout is supported, so as to render it capable of easy lateral movement when not in use.

In said drawings, 1 and 2 designate, respectively, upper and lower floors; 3, the usual timbers for supporting the floor, hopper, &c., and 4 a grain-hopper which may be connected with weighing-scales, if desired. The funnel end 5 of the hopper 4 is arranged to extend downward within a receiver 6 of somewhat funnel shape which is supported by means of flanges 7, resting on transverse beams 8, so that while the discharge-opening of the hopper 4 registers with the receptacle 6 it is free from direct connection with the supporting devices of the latter, and the settling of the building or other causes affecting the relationship of these parts would not be sufficient, under ordinary circumstances, to vary the functional relationship of the respective parts.

The upper section 9 of the spout is somewhat enlarged at the top and connected to the funnel or base portion of the receptacle or hopper 6 by means of an inwardly-projecting flange 10, which rides upon an outwardly-projecting flange 11, supplied by the funnel end of the part 6, so that the spout 9 may be revolved around the funnel as an axis, while the joint between the two is loose and capable of permitting the raising or lowering of the upper end of the spout 9 within desired limits.

An additional means of support for the spout is provided by the staff 12, the upper end of which is hinged, as at 13, to a plate 14, that is riveted to the under side of the upper spout member at or near its curved portion. The hinged connection referred to is preferably that of a somewhat rounded extension projecting downward from the fixed connection 14 into the hollow end of the staff 12, as indicated in Fig. 2, whereby the revolution and raising and lowering of the spout 9 are rendered practicable; and the lower end of the upper spout member 9 is braced by means of an arm 15, that is hinged, as at 16, to a

plate riveted to the spout, and likewise hinged, as at 17, to a sleeve 18, that is arranged to slide up or down on the staff 12 and to be secured by a set-screw, and the staff being stepped, as at 19, is free to turn, and the spout member 9 may not only be revolved about the staff, but may be raised or lowered, as desired, without moving the staff, the brace 15 being adjusted accordingly.

To the curved lower end of the spout member 9 is swiveled the lower section 20, preferably by hanging the latter upon the former in the manner indicated in Fig. 3—that is, similar to the upper joint 10 11; and in order that this lower section may be made capable of extension and contraction to meet the requirements of service an additional telescoping section 21 is provided, so that the length of the lower spout-section as a whole may be regulated as desired. For convenience of operation in telescoping and revolving the spout handles 22 are provided on the lower section.

In order to support the lower end of the spout and permit it to be easily and freely moved from one to another position, a carriage 23, riding on casters 24, is provided and connected to the spout by means of a ring 25, to which the carriage is attached by a lug 26, which is made to pass upward into an opening 27 between the projecting jaws 28 of the ring and fastened by bolts.

The lower end of the spout 20 is of curved or elbow form, as shown at 29, and its extreme lower portion is encompassed by a telescoping short section or hood 30, which may be revolved by means of a handle 31, and having in it an inclined slot 32, within which there projects from the inner pipe-section a pin 33. The hood may be raised when it is desired to move the spout from one position to another and lowered through an opening in the floor by operating the handle 31, as indicated by the positions shown, respectively, in Figs. 4 and 5.

In use, the construction and arrangement of devices being as described, the spout as a whole may be adjusted readily and accurately from one to another position within the limits of its outer circle of movement and any desired position in arcs of circles intermediate that and a circle close to the center of movement. The character of the connections with the discharge-outlet of the hopper, and the jointed and swiveled connections with the supporting staff and brace, and the swiveled and telescoping lower spout member, together with its means of support, are such that the spout as a whole may be extended or contracted or revolved and its lower end inserted in an opening in the supporting-floor to the end of rendering the spout a convenient, practical, and desirable device for use in elevators for conveying grain from a weighing or other hopper to one or another bin or receptacle.

Having described my invention, what I claim is—

1. The combination in an adjustable grain-spout, of upper and lower members having elbowed ends swiveled together so that the latter may revolve in a circle about the former; a swiveled support for the head of the upper member; a staff aiding in the support thereof, and an adjustable hinged brace connected to said staff and to the lower portion of said upper spout-section, substantially as set forth.

2. The combination in an adjustable grain-spout, of upper and lower members having elbowed ends swiveled together so that the latter may revolve in a circle about the former; a swiveled support for the head of said upper member; a staff aiding in the support thereof; an adjustable hinged brace connected to said staff and to the lower portion of said upper spout-section; the lower spout-section being composed of telescoping portions whereby its length may be regulated as desired, substantially as set forth.

In testimony whereof I have hereunto set my hand this 6th day of February, 1897.

CHARLES E. BIRD.

In presence of—
P. H. GUNCKEL,
R. BLUME.

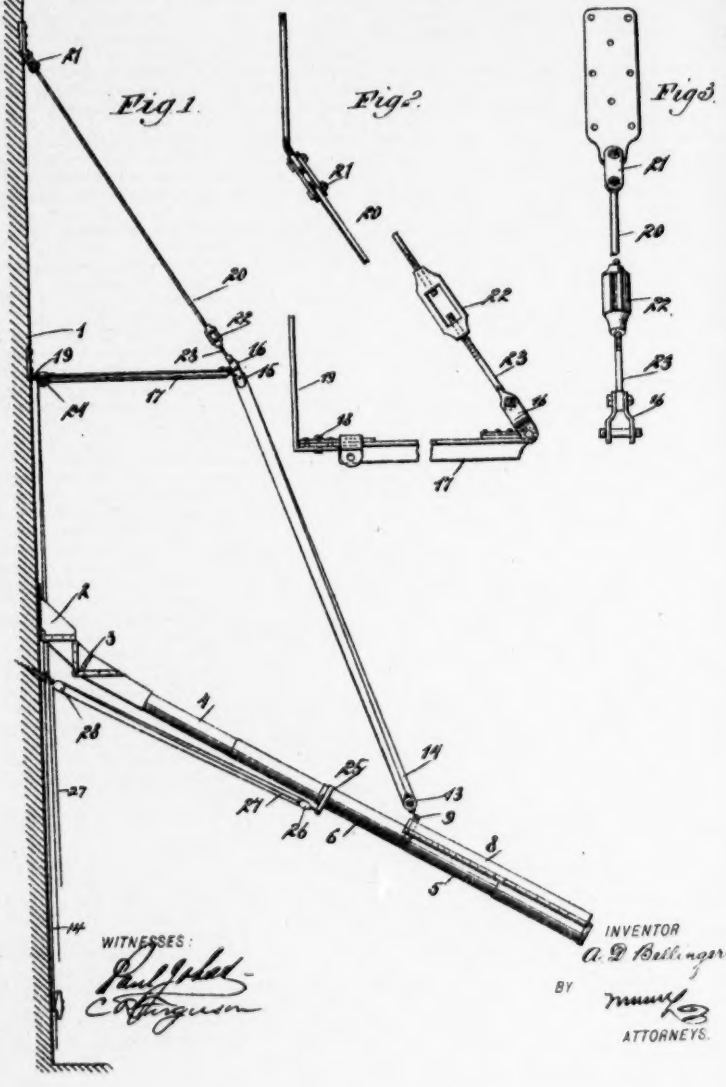
286-287

(No Model.) 2 Sheets—Sheet 1.

A. D. BELLINGER.

GRAIN SPOUT.

No. 605,375. Patented June 7, 1898.



711

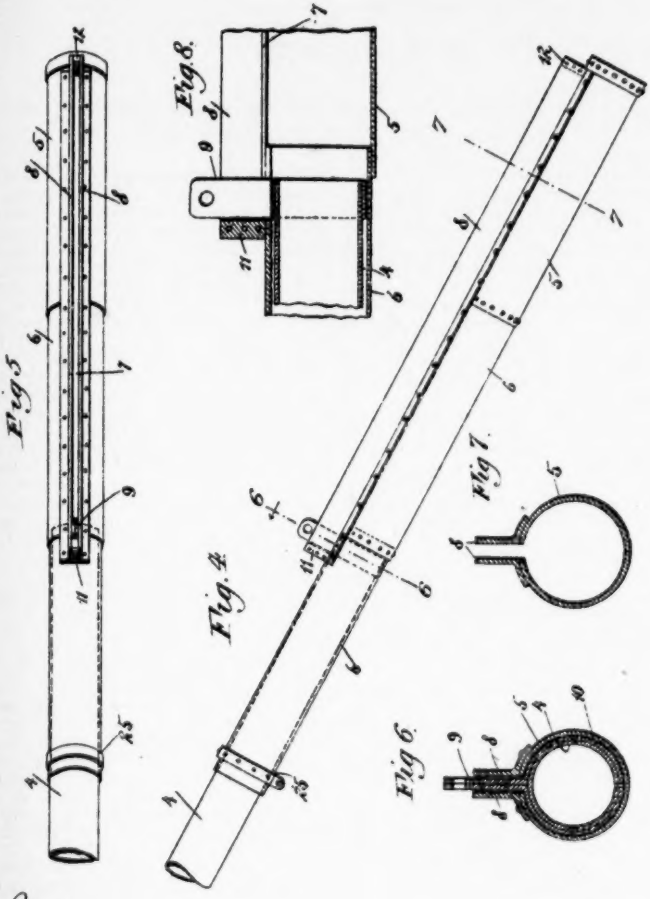
288

(No Model.) 2 Sheets—Sheet 2.

A. D. BELLINGER.

GRAIN SPOUT.

No. 605,375. Patented June 7, 1898.



WITNESSES:

INVENTOR
A. D. Bellinger.
BY
ATTORNEYS.

712

289

UNITED STATES PATENT OFFICE.

ALBERT DELOSS BELLINGER, OF WEST SUPERIOR, WISCONSIN.

GRAIN-SPOUT.

SPECIFICATION forming part of Letters Patent No. 605,375, dated June 7, 1898.

Application filed November 29, 1897. Serial No. 660,053. (No model.)

To all whom it may concern:

Be it known that I, ALBERT DELOSS BELLINGER, of West Superior, in the county of Douglas and State of Wisconsin, have invented a new and Improved Grain-Spout, of which the following is a full, clear, and exact description.

This invention relates to spouts for loading grain from elevators into boats; and the object is to provide a spout that may be easily manipulated to direct grain to any part of a boat and that may be quickly shortened and lengthened at will.

I will describe a grain-spout embodying my invention, and then point out the novel features in the appended claims.

Reference is to be had to the accompanying drawings, forming a part of this specification, in which similar characters of reference indicate corresponding parts in all the figures.

Figure 1 is a side elevation of a grain-spout embodying my invention. Fig. 2 is a side elevation of a supporting device therefor. Fig. 3 is a front view thereof. Fig. 4 is a side elevation of the spout, drawn on an enlarged scale. Fig. 5 is a top plan thereof. Fig. 6 is a section through the line 6 6 of Fig. 4. Fig. 7 is a section through the line 7 7 of Fig. 4, and Fig. 8 is a longitudinal section of a portion of the spout.

Referring to the drawings, 1 designates the wall of a grain-elevator and through which a short spout 2 leads. Pivotally connected to the short spout 2, as at 3, is what I term the "inner" grain-spout 4.

Mounted to slide on the section 4 of the grain-spout is a section 5, having an extension 6 at its upper end engaging over the section 4 of the spout. The section 5 of the spout is longitudinally slotted, as at 7, and extended upward from the section at the opposite sides of the slot 7 are plates 8. These plates 8 will not only strengthen the section 5 of the spout, so that it may be made of comparatively thin iron, but will form guideways for an arm 9, extended through the slot and between the plates. The said arm 9 is formed by the ends of a ring 10, engaging around the lower end of the inner section 4 of the spout.

Blocks 11 12 are arranged between the plates 8 at the ends. These blocks 11 12 by coming into engagement with the arm 9 will prevent the section 5 of the spout from moving too far in either direction. Attached to the arm 9 is a pulley-block 13, from which a rope 14 extends to a pulley-block 15, arranged in a clip 16, secured to the outer end of an arm 17, extended from the elevator-wall 1. This arm 17 may have a pivotal connection, as at 18, with a bracket 19, attached to the elevator-wall.

From the outer end of the arm 17 or from the clip 16 thereon a support 20 extends upward and is connected at its upper end to a metal plate 21, secured to the elevator-wall. As shown in the drawings, the support 20 may have a turnbuckle connection 22 with a rod 23, extended from the clip 16. The rope 14 extends along the arm 17 and over a pulley 24 at the inner end of said arm, and thence downward to the lower portion of the elevator.

On the upper end of the section 6 of the spout is a ring 25, to which a pulley-block 26 is connected. From this pulley-block 26 a rope 27 extends to a pulley-block 28, attached to the elevator-wall and thence downward to the lower portion of the elevator. In operation by drawing upon the rope 27 it is obvious that the sections 5 6 of the spout may be moved longitudinally of the section 4 to shorten the spout as the bulk of grain increases in the boat to be loaded. By releasing the rope the movable section will slide down by gravity. The entire spout may be raised and lowered, as shown, by means of the rope 14.

Having thus described my invention, I claim as new and desire to secure by Letters Patent—

1. A grain-spout, comprising two telescopic sections, one of said sections being longitudinally slotted at the top and adapted to slide on the other section, an arm extended from the lower end of the upper section through said slot, means for raising and lowering the spout, and means for moving the movable section on the other section, substantially as specified.

2. A grain-spout, comprising a section having a hinged connection with an elevator-wall, a lower section having an extension engaging around the first-named section, the said

713
290-291

lower section being longitudinally slotted, plates extended upward at opposite sides of the slot, an arm extended from the hinged section and extended through the slot, a lifting-rope having connection with said arm, and a draw-rope having connection with the extension of the slotted section, whereby said slotted section may be moved longitudinally of the hinged section.

ALBERT DELOSS BELLINGER.

Witnesses:
J. A. MURPHY,
CHAS. MURPHY.

714
292-293

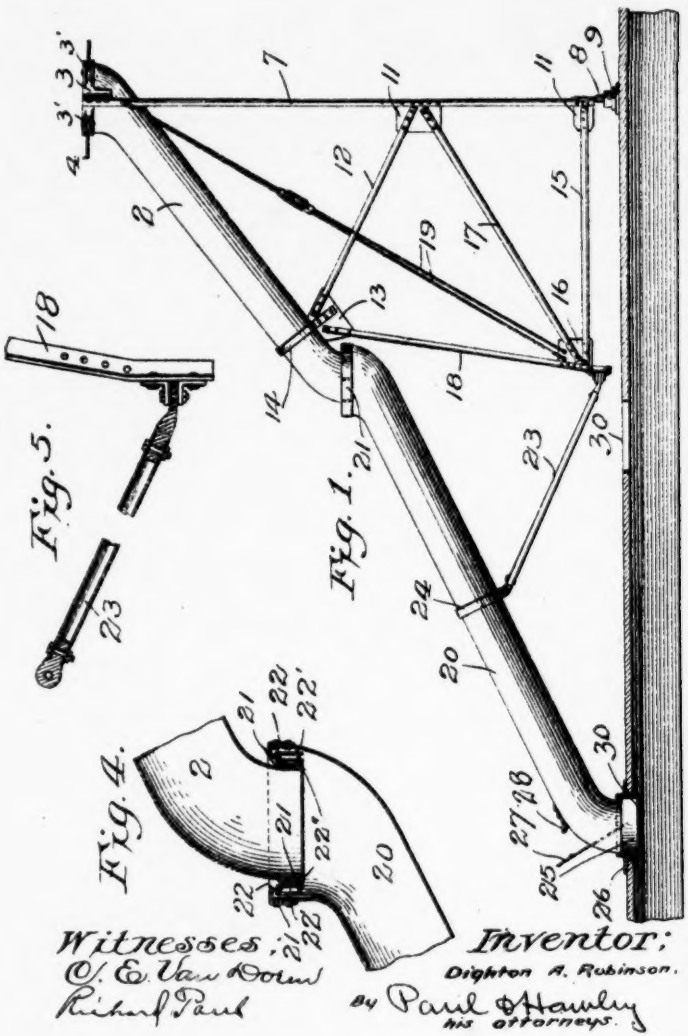
No. 622,018. Patented Mar. 28, 1899.

D. A. ROBINSON.

SWIVELED SPOUT FOR ELEVATORS.

(Application filed June 24, 1898.)

(No Model.) 3 Sheets—Sheet 1.



Witnesses:
C. E. Van Doren
Richard Paul

Inventor:
Dighton A. Robinson.
By Paul & Hawley
his attorneys.

715

294-295

No. 622,019. Patented Mar. 28, 1899.

D. A. ROBINSON.

SWIVELED SPOUT FOR ELEVATORS.

(Application filed June 24, 1898.)

(No Model.) 3 Sheets—Sheet 2.

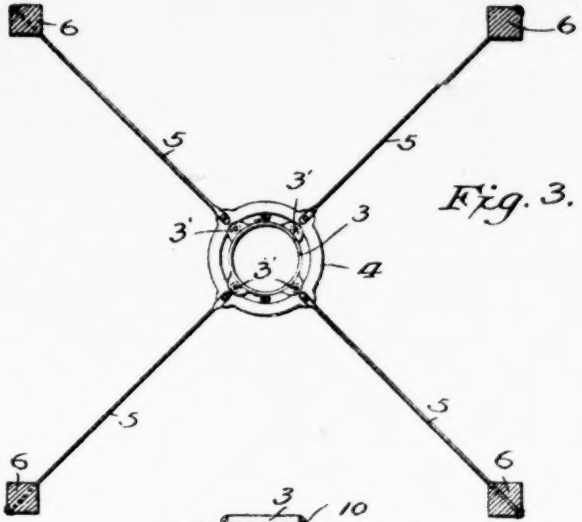


Fig. 3.

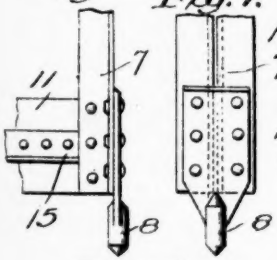


Fig. 6.

Fig. 7.

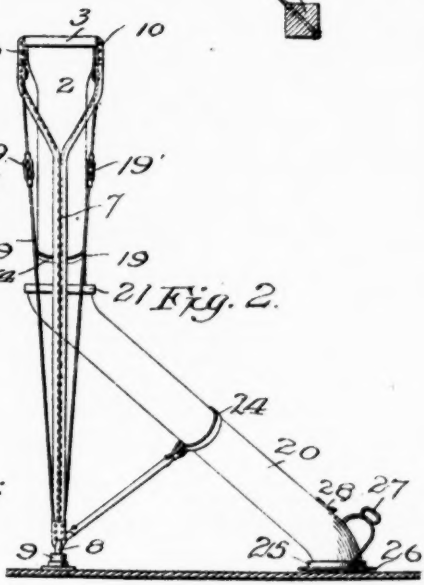


Fig. 2.

Inventor;
Dighton A. Robinson
By Paul & Hanley
his Attorneys

Witnesses;
C. E. Van Doren
Richard Paul

716

296

No. 622,019. Patented Mar. 28, 1899.

D. A. ROBINSON.

SWIVELED SPOUT FOR ELEVATORS.

(Application filed June 24, 1898.)

(No Model.) 3 Sheets—Sheet 3.

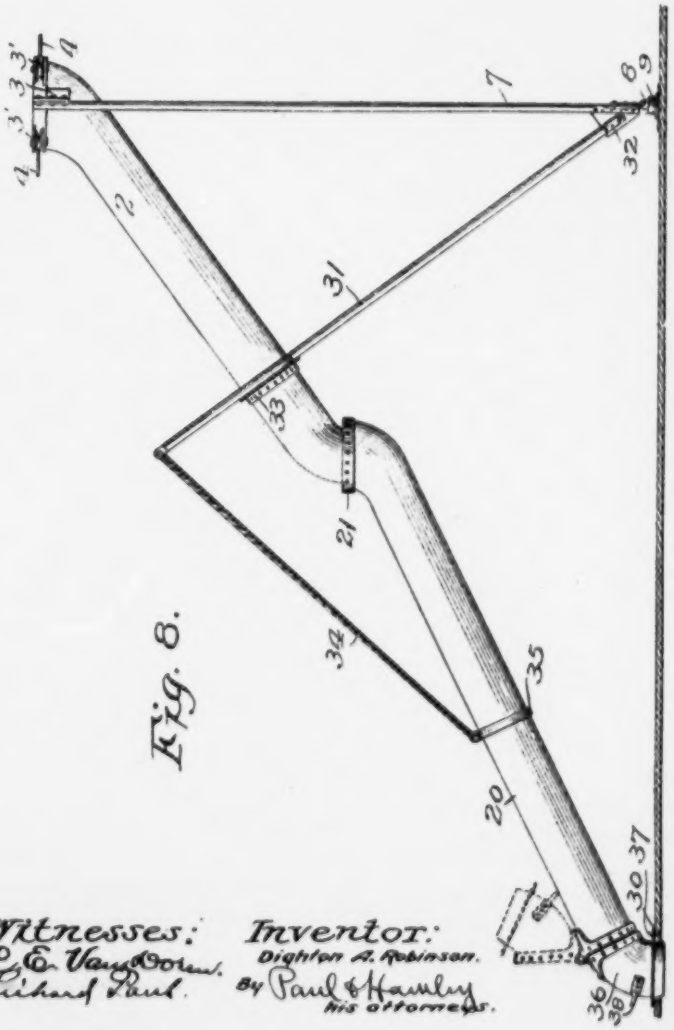


Fig. 8.

Witnesses:
C. E. VanDoren.
Richard Paul.

Inventor:
Dighton A. Robinson.
By Paul & Hamby
his attorneys.

UNITED STATES PATENT OFFICE.

DIGHTON A. ROBINSON, OF MINNEAPOLIS, MINNESOTA.

SWIVELED SPOUT FOR ELEVATORS

SPECIFICATION forming part of Letters Patent No. 622,019, dated March 28, 1899.

Application filed June 24, 1898. Serial No. 684,343. (No model.)

To all whom it may concern:

Be it known that I, DIGHTON A. ROBINSON, of Minneapolis, county of Hennepin, and State of Minnesota, have invented certain new and useful Improvements in Swiveled Spouts for Elevators, of which the following is a specification.

The invention relates to swiveled spouts for grain-elevators, and particularly to spouts for distributing grain from the scale-hopper to the different storage-bins, said spouts comprising jointed sections revolubly supported beneath the scale-hopper and adapted to discharge grain into openings in the floor at any point within the area of a circle described by the combined or aggregate lengths of the several sections.

The object of the invention is to provide means for supporting the lower section of the spout without the necessity of using rollers or carriages to travel upon the elevator-floor.

The invention consists generally in an upper inclined spout-section revolubly supported beneath the scale-hopper and a lower independent inclined section having its upper end revolubly connected to the lower end of said upper section and means supporting the lower end of said independent section independently of the elevator-floor.

Further, the invention consists in various constructions and combinations, all as hereinafter described, and particularly pointed out in the claims.

In the accompanying drawings, forming part of this specification, Figure 1 is a side elevation of a swiveled spout embodying my invention. Fig. 2 is a rear end view of the same. Fig. 3 is a sectional plan view. Fig. 4 is a detail of the swiveled connection between the upper and lower section. Fig. 5 is a detail of the pivoted braces supporting the lower section. Figs. 6 and 7 are details of the lower end of the mast or shaft whereon the upper section is supported. Fig. 8 is a side elevation of a modified means for supporting the lower end of the lower spout-section.

The distributing-spout is preferably made in two inclined sections, the upper section 2 being preferably provided at its upper end with a cast ring 3, wherein a series of friction-rolls 3' are mounted in position to engage the inner edge of an outer inclosing ring 4, that is preferably held in position by horizontal guy rods or wires 5 5, adjustably secured to the posts 6 6 upon the four sides of the spout and holding the upper end of the spout concentric with the scale-hopper, while permitting the free revolution of the section.

As a vertical support for the spout I prefer to provide a mast or standard 7, having a stud 8 at its lower end journaled in a step or bearing 9 upon the elevator-floor, wherein the standard turns when the spout is revolved, said standard being preferably forked near its upper end, the arms or tines of the fork extending upon either side of the upper section and being rigidly secured to flanges 10, provided on the inner ring 3. At the lower end of the standard and at a point preferably near the middle thereof are gusset-plates 11, the upper plate being connected by a bar 12 with a similar plate 13, that is secured to the lower end of the upper section 2 by a collar or band 14. A horizontal bar 15 connects the lower plate 11 with a similar plate 16, which is in turn connected with the upper plate 11 and the plate 13 by braces or bars 17 and 18. These braces are preferably of channel or angle iron to increase the strength and rigidity of the truss-frame. To aid in supporting the spout and particularly to prevent any undue lateral twist or strain upon the mast, I may provide guy-rods 19, having turnbuckles 19', connecting the plate 16 with the forked upper end of the standard 7. The lower inclined section 20 of the spout is provided at its upper end with a ring 21, having a depending flange 22, engaging friction-rolls 22', provided on a ring 22'' at the lower end of the upper section, whereby the two parts are swiveled together and the lower section is permitted to revolve independently of the upper section.

To support the lower end of the lower section and at the same time permit the section to be moved independently of the upper section, I provide a brace 23, pivoted at one end to a band 24 upon the lower section and at its other end pivoted to an extension on the lower end of the brace 18. The lower pivot is located substantially in a line with the center or axis of the lower end of the upper spout-section. This bar or brace 23, while supporting the lower section and preventing it from

sagging or resting upon the floor, at the same time permits it to be swung around independently of the upper section or in conjunction with it, as the operator may desire, to direct the grain into openings located at any desired points within the circle described by the combined lengths of the spout-sections.

As the lower end of the lower section does not touch the floor it is desirable to provide a device to close the gap between the lower end of the section and one of the openings 30, irregularly arranged in the floor and leading to the bins beneath. Any suitable device may be used for this purpose. In Fig. 1 I show a sleeve 25, fitting the openings in the floor and adapted to slide over the lower end of the spout and provided with a laterally-projecting flange 26 to rest upon the floor about one of the openings therein and having a handle 27, which the operator may grasp to raise up the sleeve when it is desired to move the spout. To hold the sleeve in an elevated position, a hook 28 may be provided near the lower end of the spout, over which the operator may place the handle while changing the position of the spout.

Instead of using a truss-frame I may employ the device shown in Fig. 8 for supporting the lower end of the inclined lower spout-section above the elevator-floor, said device consisting of an inclined brace or bar 31, rigidly secured at its lower end to a plate 32, provided on the mast 7, preferably near its lower end. The bar 31 extends up beneath the upper spout-section, and at a point preferably near the lower end of said section is looped around it and rigidly secured to a flanged collar 33 thereon. The upper end of the bar 31 is coincident or in line with the vertical axis of the lower end of the upper section and is connected by a chain 34 or by a bar, if preferred, with a band 35 upon the lower section 20, said band being placed in such a position upon the lower spout-section that the lower end of said section is supported above the floor without the aid of rollers or carriages and the whole section permitted to revolve independently of the upper section or in conjunction with it, as may be desired.

In Fig. 8 I have shown another construction for making a close fit with the openings in the floor. As here shown, at the lower end of the lower section I provide a short elbow 36, having a flange 37 near its lower end to rest upon the floor about an opening therein and pivoted at its upper end to the lower section and forming when in use a continuation of said section and filling the gap between the lower end of the section and the floor. When it is desired to change the position of the section, the elbow may be turned back with the aid of the handle 38 to the position indicated by dotted lines in the figure.

In other respects the construction shown in Fig. 8 is substantially the same as that heretofore described with reference to Figs. 1, 2, and 3.

A distributing-spout comprising upper and lower inclined sections constructed and mounted in the manner heretofore described may be revolved about the vertical axis of the receiving end of the upper section without touching the floor or being supported by carriages or rollers resting thereon, and the lower inclined section may be revolved not only in conjunction with the upper inclined section, but also independently of said upper section and about the vertical axis of the lower end of said upper section. This arrangement permits the operator to adjust the lower end of the lower section to discharge the contents of the spout into an opening in the floor at any point in the area of a circle whose radius is equal to the combined lengths of the spout-sections. This construction also permits me to dispense with the usual rollers or carriages for supporting the lower spout-section, and the rigid frame between the vertical standard and the spout-sections prevents any sagging of the spout and supports the lower spout-section at the desired distance from the floor and permits it to be easily revolved to adjust its discharge end over the opening leading to the bin into which it is desired to convey the grain.

The important feature of the invention is that the lower inclined spout-section be revolubly supported on the lower end of the upper spout-section with the lower end of the lower spout-section above the floor, so as to swing clear thereof. It is therefore immaterial whether the support for the lower spout-section be arranged below the upper spout-section, as in Fig. 1, or above it, as in Fig. 8. In either instance the support for the lower spout-section will be provided with a pivot or axis located substantially in a vertical line with the center or axis of the lower end of the upper spout-section and either above or below said lower end of said upper spout-section. I do not therefore limit myself to the details of construction shown and described.

By supporting the lower spout-section above the floor I am able to dispense with the use of rollers or carriages which have been generally used to support the lower end of the lower spout-section, and as distributing-spouts are frequently used before the elevator is completed and when numerous obstructions are scattered through the building it is of great advantage to be able to use the spout independently of a support that rests directly upon the floor. Furthermore, the elevator-floor is frequently covered with grain, and it has been found inconvenient and difficult to push rollers or carriages through and over the grain that lies upon the floor while moving the lower spout-section from one position to another during the operation of distributing the grain from the scale-hopper to the various bins. By suspending the lower spout-section in the manner described I have avoided all those difficulties that are attendant upon the use of a support resting directly upon the floor.

COPY BOUND C

and the operator is able to swing the distributing-spout easily and quickly to any point within the area of the circle, whose radius is equal to the combined lengths of the two spout-sections.

Having thus described my invention, I claim as new and desire to secure by Letters Patent—

1. A distributing-spout for grain-elevators, comprising an inclined upper revolubble spout-section, and an inclined lower revolubble spout-section supported upon, and free to revolve with and about, the lower end of said upper spout-section, and the lower end of said lower spout-section being above and free from the floor, substantially as described.

2. A distributing-spout for grain-elevators, comprising a revoluble upper section, a lower independent section having its upper end supported by said upper section and revoluble independently of the same, and means, independent of the elevator-floor, for supporting the lower end of said lower section, substantially as described.

3. A distributing-spout for grain-elevators, comprising an upper inclined revoluble spout-section and a lower inclined section, a swiveled connection between said upper and lower sections, and means substantially coincident with the vertical axis of the lower end of said upper section for supporting the lower end of said lower section above, and independent of the elevator-floor, substantially as described.

4. A distributing-spout for grain-elevators, comprising an upper inclined revoluble section, a lower inclined section swiveled upon said upper section and revoluble therewith, or independently thereof, a support for said upper section, and a pivotal connection supporting the lower end of said lower section above the elevator-floor and independently thereof, the vertical axis of the lower end of said upper section being substantially coincident with the axis of said pivotal connection at its junction with said support, substantially as described.

5. A distributing-spout for grain-elevators, comprising in combination an upper inclined section revolubly arranged, a standard or mast supporting the same, a lower inclined section revolubly connected to the lower end of said upper section, a brace or bar arranged between said mast and said upper section, a connection between said bar and said lower section, and the junction of said bar and said connection being coincident with the vertical axis of the lower end of said upper section, substantially as described.

6. The combination, with the upper inclined revoluble spout-section, of a lower inclined spout-section, a swiveled connection between said sections, means supporting said upper section, means supporting the lower end of said lower section above and independently of the elevator-floor, and an elbow provided at the lower end of said lower section and adapted to close the gap between said section and the elevator-floor, substantially as described.

7. A distributing-spout for grain-elevators, comprising in combination an upper section revolubly arranged, a standard or mast supporting the same, a lower section revolubly connected to the lower end of said upper section, a brace or bar arranged between said mast and said upper section and having a looped portion to embrace said section, and the upper end of said bar being coincident with the vertical axis of the lower end of said upper section, and a flexible connection between said upper end and said lower section, substantially as described.

8. A distributing-spout for grain-elevators, comprising an upper section, a lower section having its upper end revolubly connected to the lower end of said upper section, and means substantially coincident with the vertical axis of the lower end of said upper section for supporting the lower portion of said lower section, substantially as described.

9. A distributing-spout for grain-elevators, comprising an upper revoluble section, a lower section connected at its upper end to the lower end of said upper section and revoluble therewith or independently thereof, and means substantially coincident with the vertical axis of the lower end of said upper section for supporting the lower portion of said lower section, substantially as described.

In testimony whereof I have hereunto set my hand, this 20th day of June, A. D. 1898, at Minneapolis, Hennepin county, Minnesota.

DIGHTON A. ROBINSON.

In presence of—
RICHARD PAUL,
M. C. NOONAN.

CLOSE IN CENTER

302–303

No. 667,335. Patented Feb. 5, 1901.

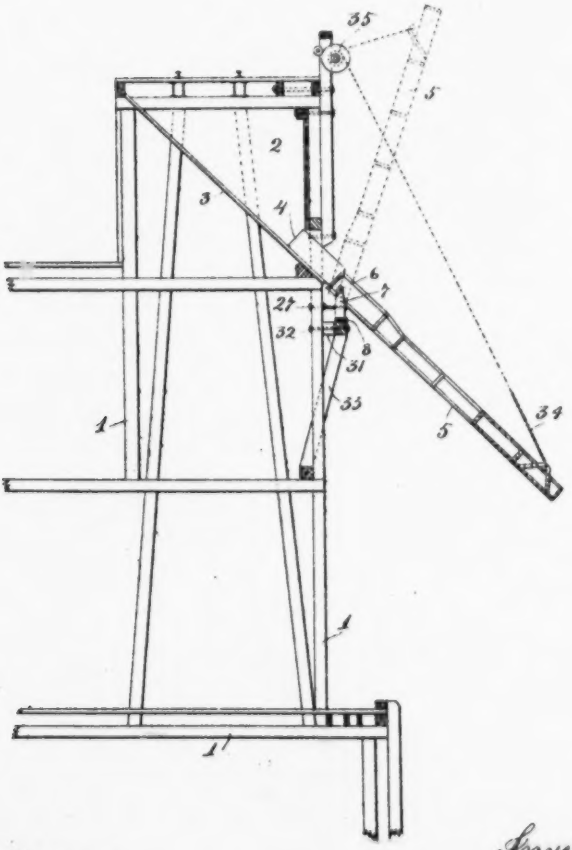
J. L. RECORD.

ADJUSTABLE COAL OR ORE SPOUT.

(Application filed Apr. 28, 1900.)

(No Model.) 3 Sheets—Sheet 1.

Fig. 1.



Witnesses.
A. X. Opsahl.
M. F. Harrison

Inventor.
James L. Record
By his Attorney.
P. H. Gunckel

No. 667,335. Patented Feb. 5, 1901.

J. L. RECORD.

ADJUSTABLE COAL OR ORE SPOUT.

(Application filed Apr. 28, 1900.)

(No Model.) 3 Sheets—Sheet 2.

Fig. 2.

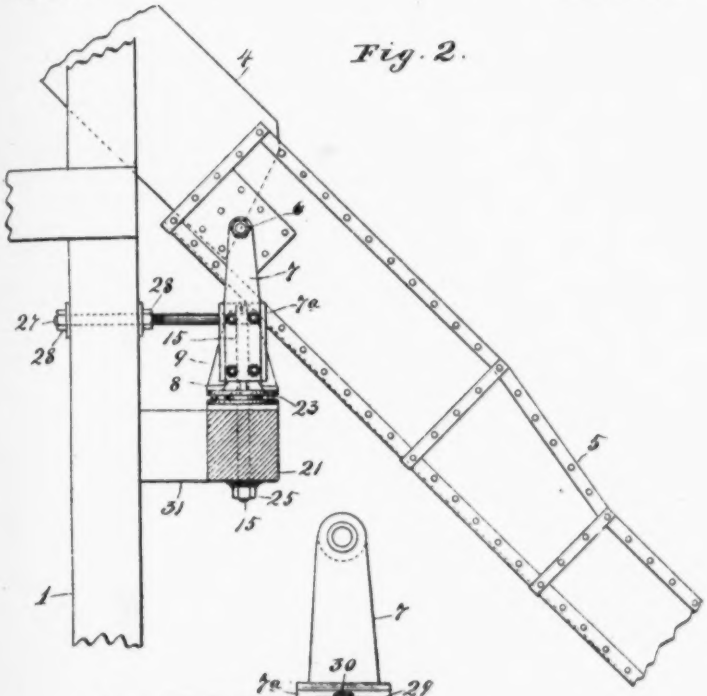
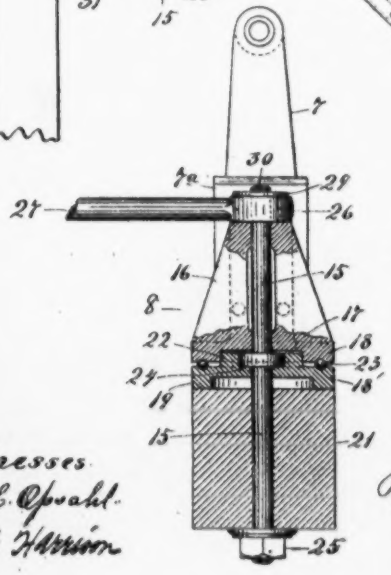


Fig. 3.



Witnesses.
A. H. Opsahl.
M. F. Harrison.

Inventor.
James L. Record
By his Attorney
P. F. Gunakel

306

No. 667,335. Patented Feb. 5, 1901.

J. L. RECORD.

ADJUSTABLE COAL OR ORE SPOUT.

(Application filed Apr. 28, 1900.)

(No Model.) 3 Sheets—Sheet 3.

Fig. 4

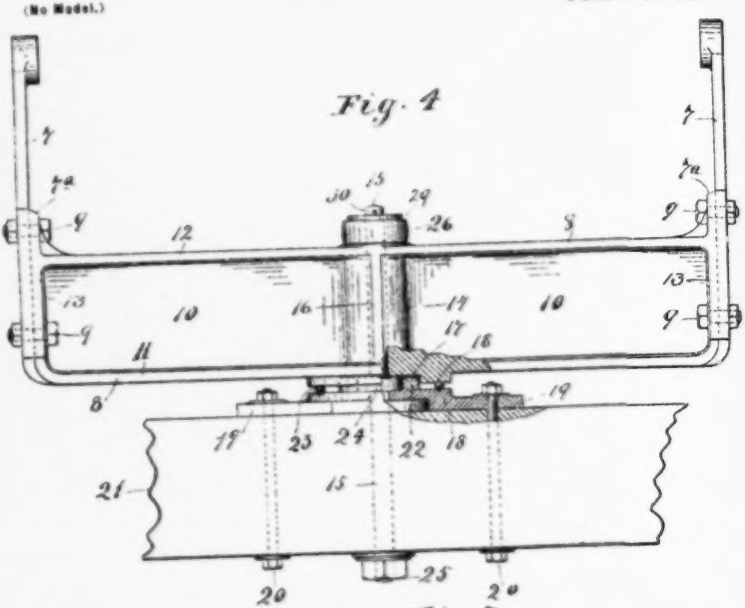


Fig. 5.

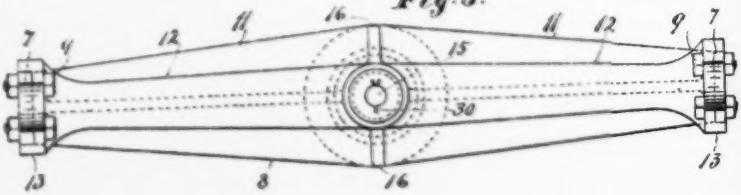


Fig. 6.



Witnesses.
A. H. Ophahl.
M. F. Harrison

Inventor.
James L. Record.
By his Attorney.
O. H. Gunckel

UNITED STATES PATENT OFFICE.

JAMES L. RECORD, OF MINNEAPOLIS, MINNESOTA.

ADJUSTABLE COAL OR ORE SPOUT.

SPECIFICATION forming part of Letters Patent No. 667,335, dated February 5, 1901.

Application filed April 28, 1900. Serial No. 14,677. (No model.)

To all whom it may concern:

Be it known that I, JAMES L. RECORD, a citizen of the United States, residing at Minneapolis, in the county of Hennepin and State of Minnesota, have invented certain new and useful Improvements in Adjustable Coal or Ore Spouts, of which the following is a specification.

My invention relates to spouts or chutes of the kind employed for conducting coal, ore, and like material by gravity from the bins on docks to vessels; and the object of the invention is to provide a strong and durable spout that is adapted to be easily raised and lowered or turned laterally to desired inclinations.

My improvements relate more especially to the devices for hinging and pivotally supporting such spouts, and they are illustrated in the accompanying drawings, in which—

Figure 1 is a side elevation of my improved spout arranged in operative position on a dock. Fig. 2 is a similar view of a portion of the spout and its supports on a larger scale. Fig. 3 is a similar view, partly in vertical section, of the devices for hinging and pivotally supporting the spout. Fig. 4 is a front elevation, with a portion shown in vertical section, of the same devices. Fig. 5 is a plan view of the bolster for supporting the spout, and Fig. 6 is a plan view of the plate providing the antifriction-bearings for the bolster.

In the drawings, 1 designates the framework of an ordinary coal or ore dock, on which is supported a bin 2. The floor 3 of the bin is suitably inclined, and in the discharge-opening is a short permanent chute 4, suitably secured at a like inclination. The spout 5, which is preferably constructed of sheet metal, is arranged with its inner end telescoping loosely a portion of the protruding fixed chute, so that the former may be turned laterally to the required degree without severing its connection with the former to an extent sufficient to interfere with its efficient use.

To support the spout and enable it to be swung laterally as well as vertically, its inner end is connected by pivots 6 to the upper portions of the standards or arms 7 of a rotatable bolster 8. These standards, together with their reinforcing-plates 7ª, are rigidly secured by bolts 9 to the ends of the bolster-body, or they may, if preferred, be formed as an integral part of the bolster-body. The latter body is of inverted-T shape in cross-section, composed of a web 10, having relatively wide flanges 11 at the base and narrower flanges 12 at the top, and from the ends of the web flanges 13 extend in transverse direction for attaching the arms 7. In its center the bolster is provided with a boss or hub 14 for receiving a spindle or pin 15, on which the bolster may be turned. Ribs 16 connect the boss and flanges to increase the strength of the bolster. The under surface of the bolster has a recess 17, concentric with the spindle, and a groove 18, also concentric with the spindle. Beneath the bolster is a plate 19, secured by bolts 20 on a beam 21, and having on its surface a circular rim 22, fitting in the way formed by the recess 17 in the bolster, and having also a circular groove 18', corresponding with the groove 18 in the under surface of the bolster, the two grooves forming a race or way for the bearing-balls 23, which constitute an antifriction-bearing for the bolster and spout it supports. Within the rim 22 is a circular disk 24, through which the spindle passes, and which, in cooperation with the guiding of the rim 22 by the walls of the recess 17, serves to steady and strengthen the pivotal connection of the bolster.

The lower end of the spindle 15 is threaded and secured beneath the beam 21 by a nut 25, and the upper end is secured in an eye 26 on a rod or brace 27, that is secured by nuts 28 to a part of the frame structure 1, a washer 29 on the eye 26 and a cotter 30 through the spindle being used, in cooperation with the nut on the lower end, to secure the spindle in place. The beam 21 may be connected to the frame 1 by timbers 31 and bolts 32 and also by supports 33, that rest on a lower portion of the frame.

Any usual or convenient means may be employed for raising and lowering the spout to the extent desired. The devices shown consist of a chain 34, attached to the outer end of the spout and arranged to be wound, by means of a crank or other device, on a drum or cone-block 35, suitably secured on the upper portion of the framework.

The construction shown and described pro-

1924
308-309

duces a spout that is capable of being easily turned on its vertical pivot in lateral direction, as required, and also easily turned on its horizontal pivots to raise and lower it, and at the same time possesses the required strength and durability.

Having described my invention, what I claim is—

1. In a discharge apparatus for coal and ore bins, the combination with a stationary chute, of a spout having its upper end arranged to receive the discharge from the chute, a bolster arranged beneath the chute for supporting the receiving end of the spout, standards on the bolster to which the spout is pivotally connected to allow its free end to be raised and lowered, a base on which the bolster is mounted, a spindle connecting them and permitting horizontal rotation of the bolster and spout, and means for raising and lowering the outer end of the spout, substantially as set forth.

2. In a discharge apparatus for coal and ore bins, the combination with a stationary chute, of a spout having its upper end arranged to receive the discharge from the chute, a bolster arranged beneath the chute for supporting the receiving end of the spout, standards on the bolster to which the spout is pivotally connected to allow its free end to be raised and lowered, a base on which the bolster is mounted, a spindle connecting them and permitting horizontal rotation of the bolster and spout, a brace for holding the upper portion of the spindle in place, and means for raising and lowering the outer end of the spout, substantially as set forth.

3. In a discharge apparatus for coal and ore bins, the combination with a stationary chute, of a spout having its upper end arranged to partially surround the mouth of the chute and receive the discharge therefrom, a bolster arranged beneath the chute for supporting the receiving end of the spout, standards on the bolster to which the spout is pivotally connected to allow its free end to be raised and lowered, a base on which the bolster is mounted, a spindle connecting them and permitting horizontal rotation of the bolster and spout, and means for raising and lowering the outer end of the spout whereby it may be elevated to substantially vertical position when not in use, substantially as set forth.

In testimony whereof I have hereunto set my hand this 20th day of April, 1900.

JAMES L. RECORD.

In presence of—
W. R. SINKS,
OTIS W. GETCHELL.

725

310-311

No. 681,378. Patented Aug. 27, 1901.

R. L. SHOEMAKER & F. R. WILLSON, Jr.

PORTABLE ELEVATING MACHINE.

(Application filed Jan. 19, 1901.)

(No Model.) 7 Sheets—Sheet 1

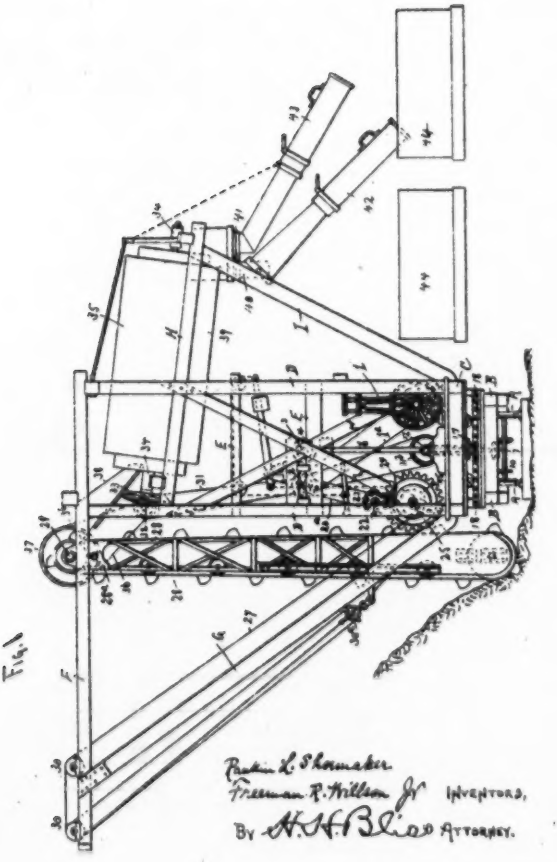


Fig. 1.

Witnesses.
C. H. Woodward
N. Curtis Lamond

Reuben L. Shoemaker
Freeman R. Willson Jr. Inventors,
By A. H. Bliss Attorney.

726

312-313

No. 681,378. Patented Aug. 27, 1901.

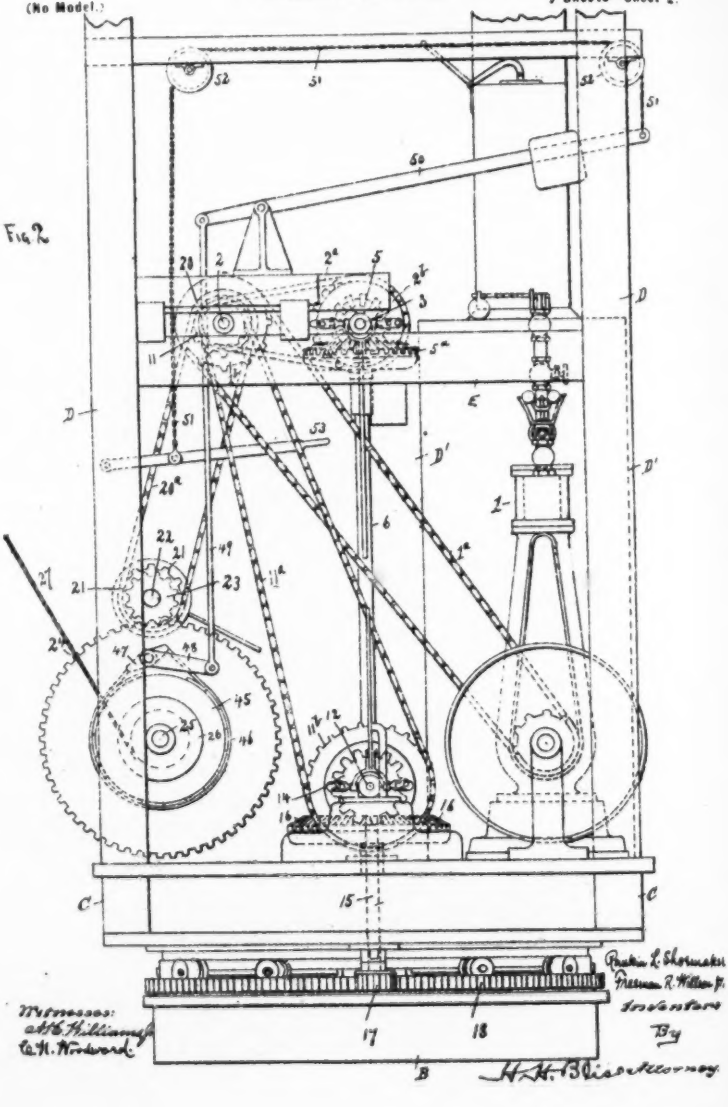
R. L. SHOEMAKER & F. R. WILLSON, Jr.

PORTABLE ELEVATING MACHINE.

(Application filed Jan. 12, 1901.)

(No Model.) 7 Sheets—Sheet 2.

Fig. 2.



Witnesses:
A. H. Williams
C. H. Woodward

Rufus L. Shoemaker
Fessenden R. Willson Jr.
Inventors
By
H. H. Bliss Attorney

314-315

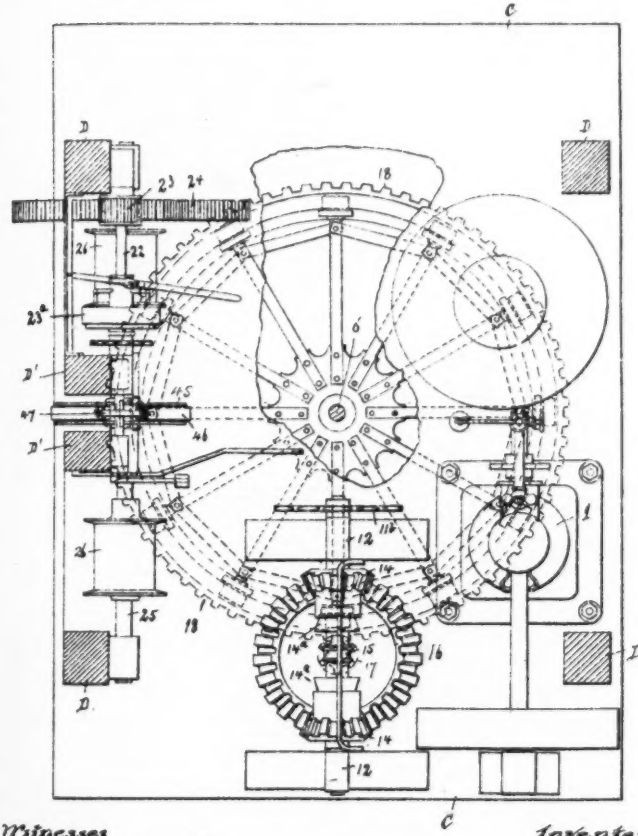
No. 681,378. Patented Aug. 27, 1901.

R. L. SHOEMAKER & F. R. WILLSON, Jr.

PORTABLE ELEVATING MACHINE.

(No Model.) (Application filed Jan. 12, 1901.) 7 Sheets--Sheet 3.

Fig. 3



Witnesses
Albert E. Williams Jr.
G. H. Woodward

Inventors,
Rankin L. Shoemaker
Freeman R. Willson Jr.

By A. H. Bliss
Attorney

728

316-317

No. 681,378. Patented Aug. 27, 1901.

R. L. SHOEMAKER & F. R. WILLSON, Jr.

PORTABLE ELEVATING MACHINE.

(No Model.) (Application filed Jan. 19, 1901.) 7 Sheets—Sheet 4.

Fig. 3

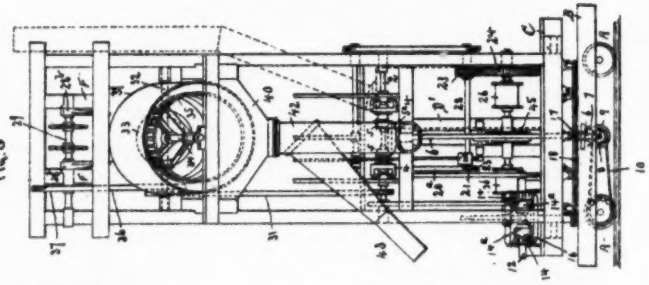
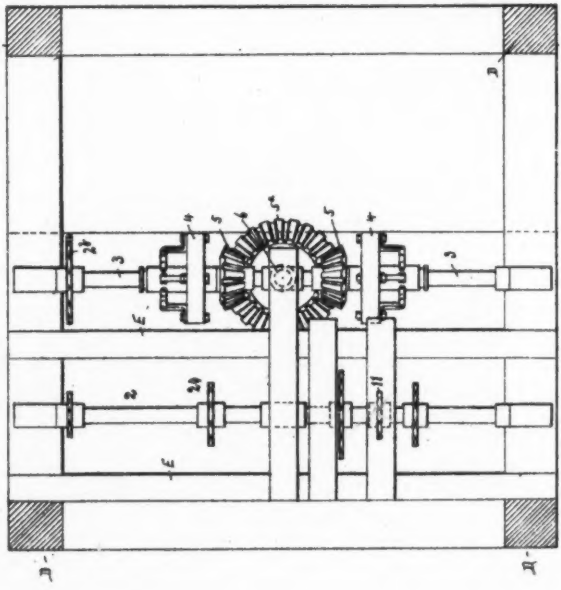


Fig. 4



Witnesses:
Alfred Williams Jr.
G. H. Woodward

Inventors,
Rankin L. Shoemaker
Freeman R. Willson Jr.
By H. H. Bliss
Attorney

729

318-319

No. 681,378. Patented Aug. 27, 1901.

R. L. SHOEMAKER & F. R. WILLSON, JR.

PORTABLE ELEVATING MACHINE.

(No Model.) (Application filed Jan. 19, 1901.) 7 Sheets—Sheet 5.

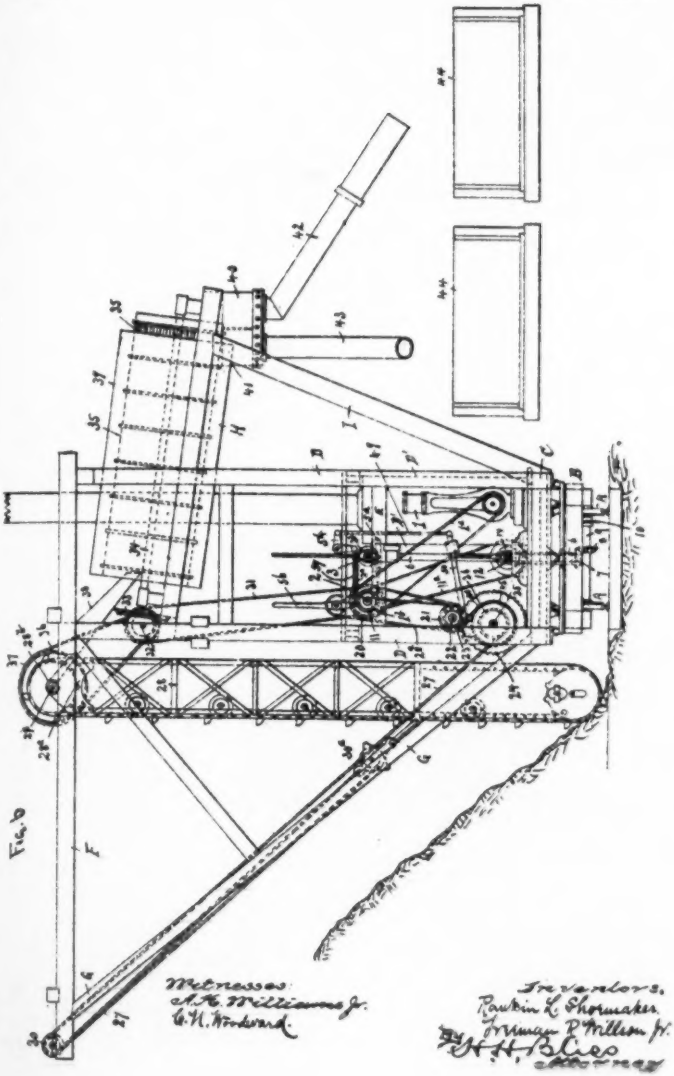


Fig. 5

Witnesses:
A. R. Williams Jr.
G. H. Woodward.

Inventors.
Rankin L. Shoemaker.
Freeman P. Willson Jr.
By H. H. Bliss
Attorney

320-321

No. 681,378. Patented Aug. 27, 1901.

R. L. SHOEMAKER & F. R. WILLSON, Jr.

PORTABLE ELEVATING MACHINE.

(Application filed Jan. 12, 1901.)

(No Model.) 7 Sheets—Sheet 6.

Fig. 6

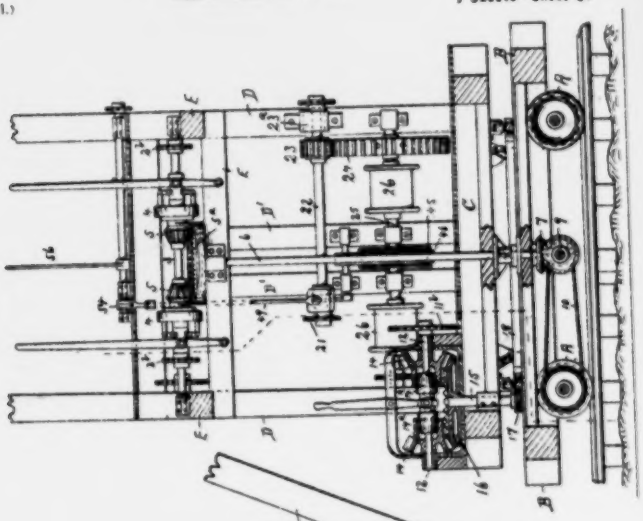
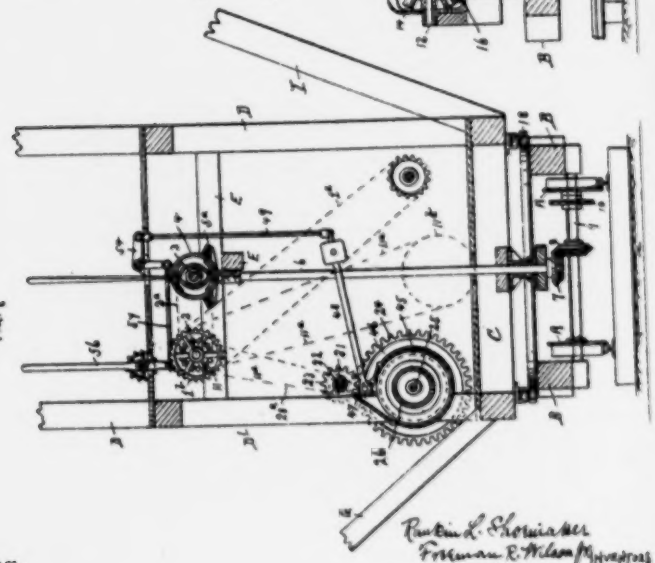


Fig. 7



Witnesses.
G. H. Woodward.
N. Curtis Lammond

Reuben L. Shoemaker
Freeman R. Willson Jr. Inventors
By H. H. Bliss Attorney.

681
322

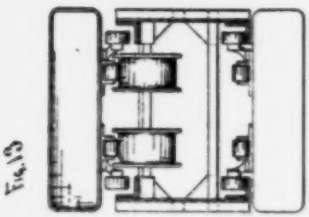
No. 681,378. Patented Aug. 27, 1901.

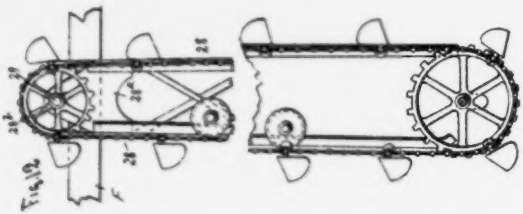
R. L. SHOEMAKER & F. R. WILLSON, Jr.

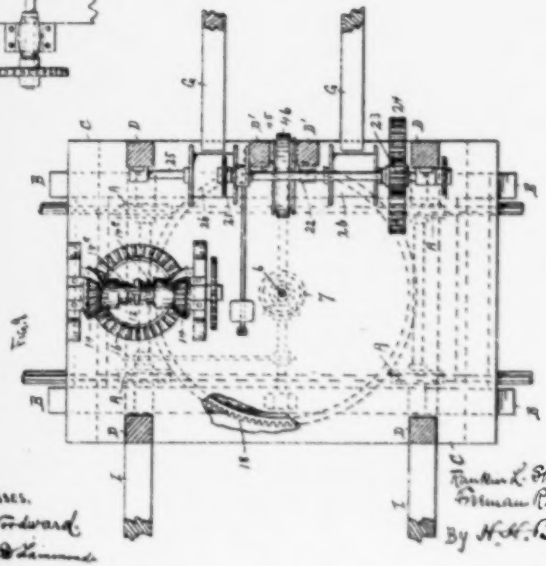
PORTABLE ELEVATING MACHINE.

(No Model.) (Application filed Jan. 18, 1901.) 7 Sheets—Sheet 7









Witnesses,
S. W. Woodward
W. Cook Lemmon

Reuben L. Shoemaker
Francis R. Willson, Jr. Inventors
By W. H. Bliss Attorney.

UNITED STATES PATENT OFFICE.

RANKIN L. SHOEMAKER, OF NEW COMERSTOWN, AND FREEMAN R. WILLSON, JR., OF COLUMBUS, OHIO, ASSIGNORS TO THE JEFFREY MANUFACTURING COMPANY, OF COLUMBUS, OHIO.

PORTABLE ELEVATING-MACHINE.

SPECIFICATION forming part of Letters Patent No. 681,378, dated August 27, 1901.

Application filed January 12, 1901. Serial No. 43,048. (No model.)

To all whom it may concern:

Be it known that we, RANKIN L. SHOEMAKER, of New Comerstown, in the county of Tuscarawas, and FREEMAN R. WILLSON, Jr., residing at Columbus, in the county of Franklin, State of Ohio, citizens of the United States, have invented certain new and useful Improvements in Portable Elevating-Machines, of which the following is a specification, reference being had therein to the accompanying drawings.

Figure 1 is a side view of a mechanism embodying our improvements. Fig. 2 is an elevation, on a larger scale, of the operative parts of the mechanism. Fig. 3 is a horizontal section on the line x x of Fig. 2 with the floor partially broken away to illustrate the construction of the frame-revolving mechanism. Fig. 4 is a section on the line y y of Fig. 2, showing the framework and some of the parts attached thereto, looking downward. Fig. 5 is a side elevation looking from the left in Fig. 6. Fig. 6 is a side view of a modified mechanism embodying our improvements. Fig. 7 is an enlarged sectional side elevation. Fig. 8 is an enlarged sectional rear elevation; and Fig. 9 is a transverse section of the lower portion of the supporting-framework and the machinery carried thereby as illustrated in Fig. 6. Figs. 10 and 11 are enlarged details of the mechanism for throwing the hoisting-drums out of gear. Figs. 12 and 13 are enlarged details of the elevator construction.

The operative parts of the mechanism are supported upon a car having wheels A A, adapted to fit ordinary railway-tracks, a bottom truck-body B, resting upon the wheel-axles, and an upper horizontally-adjustable table or bed C. The bed C carries corner-uprights D D and intermediate uprights D'. The uprights are connected together by suitable sills or cross-girths E at suitable distances from the bed, and at the upper end of the main frame there are elongated laterally-projecting overhanging frame-bars F F, the outer ends of which are braced by inclined beams or bars G. In the opposite direction there extends laterally from the main frame a supplemental frame having the top bars H and inclined brace-bars I for the supporting of parts to be described. Upon the framework thus described are supported the mechanism for engaging with and elevating the material, the mechanism for screening and separating, the means for guiding the separated materials to their places of delivery, the parts by which adjustments can be effected of those mechanisms which can be moved upon the frame, the engine or motor, and the means for transmitting power from the latter to the various parts of the machine.

1 is an engine mounted on the bed C and having its shaft connected by a chain 1^a to the chain-wheel 1^b on the shaft 2. This shaft transmits power to the shaft 3 through the chain 2^a and the sprocket-wheel 2^b. The shaft 3 has two loose bevels 5 5, which can be engaged with the shaft by clutches 4 4, respectively.

5^a is a bevel-wheel adapted to be engaged alternately with the bevels 5 5 or be disengaged from both.

6 is a shaft to which the bevel-wheel 5 is secured, this shaft extending downward at the central vertical line of the bed and the car-truck. At its lower end it is provided with a bevel-wheel 7, which engages with a bevel-wheel 8 on a shaft 9, supported on the under side of the truck-frame. The shaft 9 is connected by a chain 10 to one of the car-axles. When one of the clutches 4 connects its wheel 5 to shaft 3, the latter, being in constant rotation, rotates the bevel-wheel 5^a, the vertical shaft 6, the bevel-gearing 7 8, and the car-axle, causing the car, with all of the parts supported thereon, to move bodily along the track. It can be moved in the opposite direction by reversing the clutches at 4 4. After the car has been brought to the desired place for working the clutches are put in their neutral position and the car is held stationary.

In order to adjust the upper bed and the operative parts supported thereon in horizontal planes relative to the truck, the following devices are used:

On shaft 2 there is a sprocket-wheel 11, which drives chain 11^a, the latter engaging

703
324

with the sprocket-wheel 11^b on a shaft 12, mounted just above the bed C. This shaft has two loose bevel-pinions 14, adapted to be connected to the shaft by clutches 14^a, both wheels meshing with the horizontal bevel-wheel 16 on a vertical shaft 15. The lower end of this shaft carries a spur-pinion 17, which meshes with a circular rack 18, the latter being secured rigidly to the car-truck. If the clutches at 14^a 14^a are moved in one direction, the corresponding bevel-wheel 14 causes the parts at 16, 15, 17, and 18 to impart rotation to the bed C and the parts above it, and by throwing the clutches in the opposite direction the other bevel-wheel causes the rotation of the bed in the other way.

After the car-truck and bed have been put in proper places, as above described, the operating mechanisms are actuated as follows:

20 is a sprocket-wheel on shaft 2, connected with a sprocket-wheel 21 on shaft 22 by the chain 20^a.

23 is a spur-pinion on shaft 22, which engages with the wheel 24, there being at 23^a a clutch for connecting and disconnecting the shaft 22 and the spur-pinion 23. The wheel 24 is on the shaft 25, to which are secured two rope-drums 26.

27 is a rope running from each drum up along the inclined bars G, passing over a fixed sheave 30, thence downward to a movable sheave 30^a, thence back to the fixed sheave, and from there again to the movable one. The sheave 30^a is connected by a link to the elevator-frame, and as this frame is suspened from the shaft 29 at the top the ropes, drums, and drum-rotating devices can be used to throw the lower end of the elevator outward and hold it in any desired inclination. The elevator has a frame 28, formed of vertical bars, straight brace-bars, inclined brace-bars, bottom plates, and top plates, all substantially as shown.

The top plates 28^a are provided with tubular bearings, which are fitted upon the journals 28^b, secured to the top frame-bars F. The shaft 29 at the upper end of the conveyer is mounted in the bearings 28^b, this shaft and bearings or journal parts 28^a being supported independently of each other, so that the shaft is free from the strain and pressure caused by the weight of the conveyer-frame.

Power is taken from the shaft 2 by chain 31 to an intermediate shaft 32. This shaft is connected by a bevel-gear at 33 to the shaft 34 of a revolving screen 35. The shaft 32 also has a sprocket-wheel, which is connected by the chain 36 to a wheel 37 on the shaft 29 at the upper end of the elevator. When the shafting and chains are in operation, the elevator chains and buckets will be moved, the buckets loading themselves at the bottom of the elevator with the sand, gravel, or other material that is to be carried. This material is delivered to the chute 38, which discharges it into the interior of the rotary screen 35. Around this screen there is a drum 39, the drum and screen being set at a relatively sharp inclination, so that the materials in them respectively will be advanced toward the lower end and discharged.

The mechanism shown is principally used for elevating sand and gravel and then separating them, and in such case the gravel will be retained in the inner screen and finally delivered at its lower end, while the sand that is separated therefrom and is caught in the outer drum will be separately delivered. The gravel-receptacle is shown at 40 and the sand-receptacle at 41. With the receptacle 40 communicates the extensible and horizontally-adjustable delivery-chute 42, and with the receptacle 41 communicates another to it is adjustably secured the chute 43, these chutes being adapted to deliver the materials which they carry downward to cars, as at 44.

Description has been given above of the manner of swinging outward the lower end of the elevator-frame around the shaft 29 as an axis. When the elevator-frame is being allowed to return toward the main frame, we control its downward movement as follows.

45 is a friction-drum on the shaft 25. 46 is a flexible brake-band surrounding this brake-drum and having its ends connected to a lever 47, the crank-arm 48 of which is connected to a link 49. These parts can be operated in any suitable way. In one mechanism shown in the drawings the link 49 is pivoted to a lever 50, with which a chain 51 is connected, which runs over guide-pulleys 52 and down to a handle-lever 53, accessible to the operator. In the other mechanism illustrated the link is connected to a bell lever 54, which in turn is connected to lever 56 by a link 57.

What we claim is—

1. In an elevating and screening mechanism of the character described, the combination of the wheeled truck-frame, the main frame horizontally adjustable on the truck-frame, the outward-swinging elevator suspended at its upper end from the main frame, the screening mechanism, the power devices on the main frame, power-transmitting devices connecting the power devices with the elevator-chains and with the screening devices, means for detachably connecting the power devices to the elevator-adjusting devices, reversible power-transmitting devices for detachably connecting the power devices to the truck-wheels, and reversible power-transmitting devices for detachably connecting the power devices to the means by which the main frame is adjusted axially, substantially as set forth.

2. In a portable elevating and screening mechanism, the combination of the wheeled truck-frame, the main frame thereon, the outward-swinging elevator suspended at its upper end from the main frame, the screening mechanism, the power devices on the main frame, the power-transmitting devices connecting the power devices with the ele-

734
325-327

vator-chains and with the screening devices, means for detachably connecting the power devices to the elevator-adjusting devices, and means for controlling at will the inward swinging of the elevator-frame, substantially as set forth.

3. In an elevating and screening mechanism, of the character described, the combination of the wheeled truck-frame, the main frame hereon, the outward-swinging elevator extended at its upper end from the main frame, the screening mechanism, the power devices on the main frame, power-transmitting devices connecting the power devices with the elevator-chains and with the screening devices, the horizontally and vertically adjustable chutes, one for the tailings of the screen and one for the material which passes radially from the screen, and means for adjusting the screening mechanism bodily horizontally relatively to the truck-frame, substantially as set forth.

RANKIN L. SHOEMAKER.
FREEMAN R. WILSON, Jr.

Witnesses:
C. A. Dodds,
Robt. H. Jeffrey.

735

328

No. 694,579. Patented Mar. 4, 1902.

E. L. RANSOME.

SELF DUMPING HOIST.

(Application filed July 17, 1901.)

(No Model.)

FIG. 1.

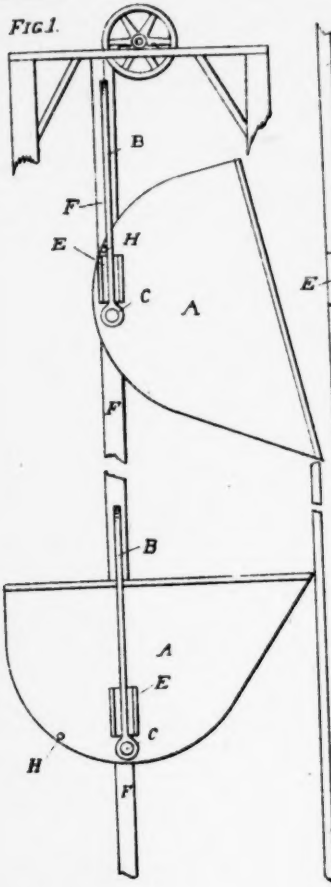


FIG. 2.

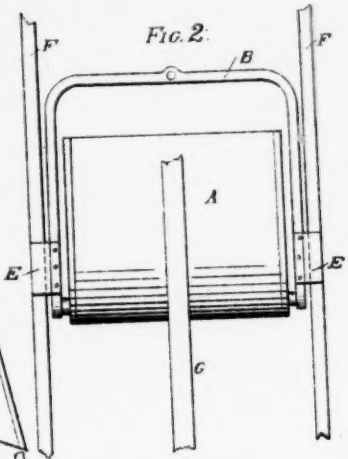
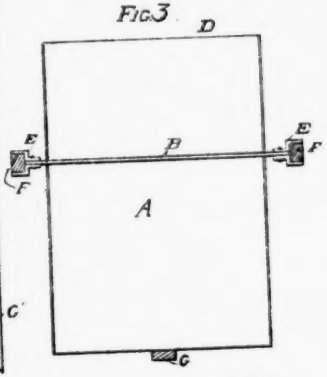


FIG. 3.



WITNESSES

George T. Allen.

John Ellendt.

INVENTOR

Ernest Leslie Ransome.

329-331

UNITED STATES PATENT OFFICE.

ERNEST LESLIE RANSOME, OF NEW YORK, N. Y.

SELF-DUMPING HOIST.

SPECIFICATION forming part of Letters Patent No. 694,579, dated March 4, 1902.

Application filed July 17, 1901. Serial No. 68,703. (No model.)

To all whom it may concern:

Be it known that I, ERNEST LESLIE RANSOME, a citizen of the United States, residing at the city of New York, in the State of New York, have invented an Improved Self-Dumping Hoist; and I hereby declare the following to be a full, clear, and exact description of the same.

My improvement relates to that class of hoists that are used for elevating materials vertically—as, for example, material used in the erection of a building or mineral out of a mine.

It consists of a tub, the bail of which slides upon guides, while the tub is sustained in the required vertical position by a bar against which it slides and over which it turns and discharges.

The accompanying drawing illustrates my invention, in which—

Figure 1 is a side view of the hoist in two positions with one guide removed. Fig. 2 is a front view. Fig. 3 is a plan.

A is the tub.

B is the bail; C, the trunnions.

D is the rear of the tub.

E E are slides on the bail.

F F and G are fixed guides, and H is a stop.

My invention is as follows: Any suitable tub A is hung on the handle of bail B upon trunnions C, which are placed well below the center of gravity of the tub and to the rear thereof in such a manner that when hung the tub by its own gravity falls forward either when empty or full. The bail is held by slides E to the fixed guides F in such a manner that the tub can freely slide up and down between them. Bar G is fixed in front of the discharge side of the tub and at such a distance from the line of the guides F as to sustain the tub in a vertical position right side up. This bar extends to the height of the required lift. Bar G may be divided into as many sections as necessary, and by adding or removing one or more sections the height of the tub can be regulated roughly. For a closer regulation one bar may be lapped past another, as shown at G'. In operation, the weight of the tub being mostly forward, as it is hoisted it bears against the bar G and slides upon it until the top thereof is reached, when as it is raised higher it turns upon the bar G until it becomes sufficiently inverted to discharge its contents. The tub is then lowered, and as it falls it returns back upon the bar G and resumes its first position. The tub can be hoisted by any convenient means. Stop H prevents the tub from overturning too far.

Instead of attaching the bail to the fixed guides the tub may be attached by its trunnions or in any other convenient manner that will permit of free movement up and down.

The tub is hoisted and the fixed guides are held in place by any suitable means.

Having thus fully described my invention, what I claim, and desire to secure by Letters Patent, is—

1. A hoisting-tub swung on a bail wherein it overturns by its own weight, in combination with fixed guides upon which the bail moves, a stop to prevent the tub from overturning too far, and a guide-rail in front of the tub which retains the tub in position and upon the top of which the tub tips, substantially as described.

2. The hoisting-tub A swung in the bail B in combination with fixed guides F and the guide-bar G, substantially as described.

ERNEST LESLIE RANSOME.

Witnesses:
JOHN ELLENDT,
GEORGE T. ALLEN.

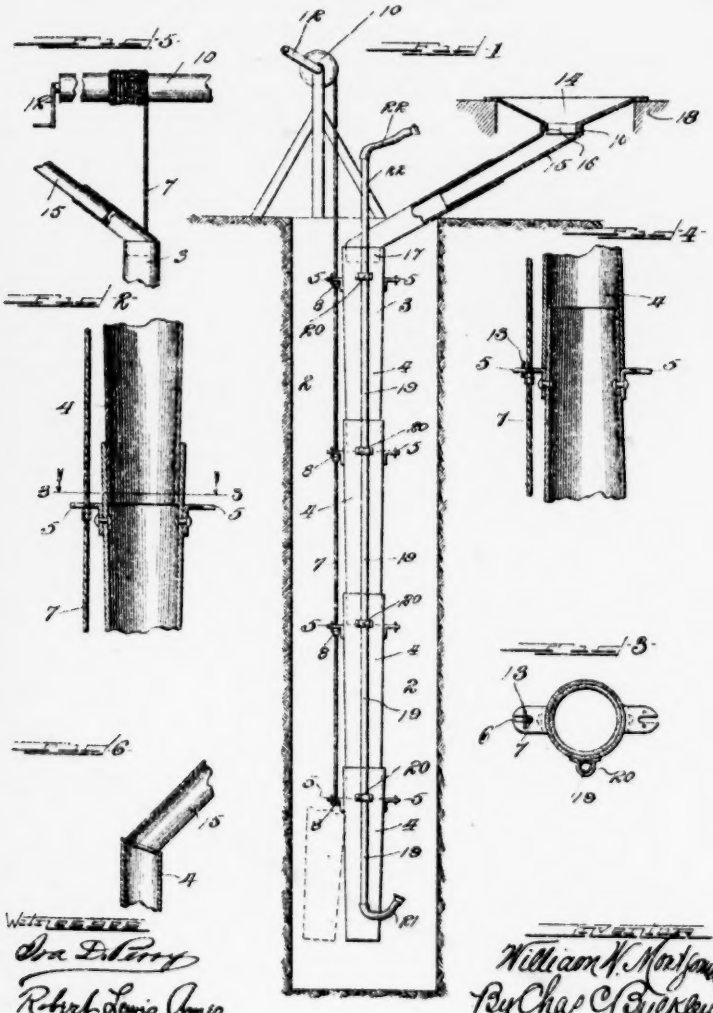
No. 702,372. Patented June 10, 1902.

W. W. MONTGOMERY.

CONDUCTOR FOR CONCRETE.

(Application filed May 27, 1901.)

(No Model.)



Witnesses:
Ira DeLong
Robert Lewis Ames.

Inventor:
William W. Montgomery
By Chas C. Buckley
Atty

333

UNITED STATES PATENT OFFICE.

WILLIAM W. MONTGOMERY, OF CHICAGO, ILLINOIS, ASSIGNOR OF ONE-HALF TO THOMAS H. MONTGOMERY, OF CHICAGO, ILLINOIS.

CONDUCTOR FOR CONCRETE.

SPECIFICATION forming part of Letters Patent No. 702,372, dated June 10, 1902.

Application filed May 27, 1901. Serial No. 62,024. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM W. MONTGOMERY, a citizen of the United States of America, and a resident of Chicago, Cook county, Illinois, have invented a certain new and useful Improvement in Conductors or Conveyers for Concrete, Cement, and the Like, of which the following is a specification.

My invention relates to apparatus for conveying concrete, cement, mortar, and like material to the bottom of excavations, caissons, pits, and other similar inaccessible places. It has been customary heretofore to lower such materials by means of buckets and windlasses or by other hand devices; but such methods are slow, laborious, and expensive, besides being otherwise unsatisfactory.

It is the object of my invention to provide a means or apparatus for overcoming the above-stated objections and to accomplish the results sought in a simple, inexpensive, and efficient manner.

In carrying out my invention I provide a conveyer or conductor consisting of a pipe, tube, or spout composed of a plurality of similar sections adapted to be supported by a cable, wire, rope, chain, or like means from a hoisting apparatus, as a windlass, at the surface of the ground and to reach from the surface to the bottom of the pit, caisson, or excavation. Means, such as a funnel, is provided for the topmost section to enable the cement or other material to be readily poured, shoveled, or otherwise directed into the spout or conveyer. The sections enable the conveyer to be used at any depth, to be readily lowered or raised, and to not be unwieldy in storing or in moving from place to place. Being suspended from above, the pipe or conveyer may be easily swung about in any direction to direct the cement or other matter to any desired point in the pit or excavation, this being more readily accomplished by a workman at the bottom. It often becomes desirable or necessary in such work to communicate between the bottom of the caisson or pit and the surface of the ground, and more or less inconvenient methods have been adopted for the purpose; but in my invention I propose to arrange for this by attaching sections of a speaking-tube to the sections of the conveyer, so that when the tube is built up a speaking-tube from the bottom to the top is also completed, through which conversation may readily be held whenever desired.

The invention further comprises the novel construction, parts, and combinations of parts hereinafter described, and further pointed out in the appended claims, reference being had to the accompanying drawings, forming a part hereof, in which the same reference characters designate like parts throughout the several views, and in which—

Figure 1 is a side elevation of the invention, showing it reaching to the bottom of an excavation. Fig. 2 is an enlarged longitudinal sectional view through one of the joints of the sections. Fig. 3 is a cross-sectional view on the line 3 3 of Fig. 2. Fig. 4 is a view similar to Fig. 2 of a modification. Fig. 5 is a view of a modified funnel, spouts, and arrangement. Fig. 6 is another modification of the spout and sections.

In the figures the numbers 2 designate a pit or excavation of some sort extending some distance below the surface of the ground. It may not have the regular outlines shown, as the drawings are only intended to represent diagrammatically a deep hole in the earth, at the bottom of which it is desired to use concrete, cement, or like material. The invention may be used in any similar relation, as in the construction of bridge or other foundations built under water with or without caissons, or wherever it is desired to lower such material from one elevation to another.

The conveyer 3 comprises the individual sections 4, which are preferably made of heavy sheet-iron of sufficient thickness to withstand the particular work required of it and are slightly larger at the top than at the bottom, so that the lower end of one section will fit within the upper end of the next lower section, and so on, the overlapping portions being uniform or the same at each joint and sufficient to constitute a good connection. Each section is provided, preferably near its upper end, with lugs or ears 5, riveted or otherwise secured to said sections and similarly located on each section, the said ears or lugs being slotted, as at 6 in Fig. 3, for the reception of the supporting-cable 7, which

COPY BOUND CLO

is provided with enlargements 8, such as stop-bolts, beneath each lug or ear 5, so as to prevent it from slipping through the slots of the ears or lugs 5. The cable extends to the surface of the ground through the said slots of the lugs on each and all of the sections of the conductor or conveyer and is wound upon the windlass 10, journaled in suitable bearings or supports 11 on each side of the opening of the excavation 2 and is adapted to be rotated by a crank 12 or other desirable means to raise and lower the said conveyer or conductor to the desired extent. The cables may be retained in the slots 6 by any suitable latch device, as the staple 13, adapted to be inserted through the apertures provided therefor in the ears or lugs 5, so that the cable 7 will not escape from the slots 6. It will thus be noticed that the entire weight of the conductor 3, as well as that of each section 4, is carried upon the cable 7 and that the sections are also laterally supported by the cable through the medium of the ears 5.

In order to conveniently pour the concrete or like material into the top of the conductor or conveyer 3, a hopper or funnel 14 is provided and is connected with the top of the tube 3 by means of the spout 15. The hopper 14 is preferably square in outline for ease in constructing a platform or runway about or along one side of it, upon which runway or platform the material can be wheeled and dumped into the hopper 14. The spout 15 is capable of a slight rotation about the collar or neck of the hopper by means of the rivet-and-slot connection between them to allow for the sidewise travel of the conveyer 3 as the cable unwinds from or is wound upon the windlass. The lower end 17 of the spout is preferably given a downward bend to cause it at all times to stay in the top of the conductor 3 and to permit such sidewise movement. The said spout is preferably telescopic, as shown in Fig. 1, to permit its necessary elongation and contraction during such movement of the conductor 3.

In the modification of Fig. 5, where the spout 15 is in a vertical plane parallel to a similar plane through the windlass, only the means for lengthening and shortening the spout need be provided, since the rotation of the parts is eliminated. Either arrangement could be adopted. Again, as in Fig. 6, the upper ends of the sections could be cut on a slant, so that a larger spout 15 and one without the downward curve 17 could be employed.

In lowering the device into the excavation the cable is first attached in the ear 5 of the lowest or first section, which is lowered a slight distance, and the next section placed in position, with its lower end on top of the other section and with the cables 7 in slots 6 of its ears or lugs 5, which sections are then lowered and another section added, and so on until the bottom of the pit, excavation, or caisson is reached. The funnel or hopper 14, which, as stated, is suitably supported by a framework, (indicated at 18,) is connected by means of the spout 15 with the top of the last section of the tube or conveyer, all the joints and connections of the hopper with the conveyer being sufficiently loose and free to permit such connection in an easy and convenient manner. The concrete may now be thrown or poured into the hopper 14, and will run down the spout 15 into the conveyer 3. As the whole tube 3 is suspended from a single cable, its lower end may be swung about as desired, as indicated in dotted lines in Fig. 1, to direct the falling matter to any desired point to distribute evenly or as preferred. The device may be raised to any extent as the excavation fills, or when it is desired to entirely remove it from the pit, the spout 15 being first withdrawn and the sections 4 being removed as the tube is raised. The windlass is of course provided with means to sustain the tube at any elevation. In the modification in Fig. 4 the sections appear in the reverse direction, the upper end of the lower section being inserted in the end of the section above. In this case the upper sections could rest directly upon ears or lugs 5 of the next lower section. The double set of ears 5 may not be necessary, but are provided for convenience in case the other ears give out or it becomes necessary to suspend the tube from the other side.

In order to communicate between the lower end of the pipe and the upper end, I provide each section 4 of the conveyer 3 with corresponding sections 19 of a speaking-tube, which may be secured to the sections 4 by strips 20 or in any other desired manner. When the sections 4 are placed together, the sections 19 of the speaking-tube will be joined together and form a continuous tube from the top to the bottom of the pipe. The lower section 4 of the conveyer may have this tube provided with an extension 21, which may be flexible, as indicated, or otherwise in order that it may be conveniently spoken into. The branch 21 may extend from any portion of the section near the top, bottom, or midway therebetween or may be taken off from the tube of the section above, according to the positions most convenient. The upper end of the tube may also be fitted with an extension 22, similar to the one at its lower end, only longer, and which likewise may be flexible and used at any desired angle. This extension will preferably be removable, so that it may be inserted in the upper end of the tube of the last conveyer-section. It will also be understood that these extensions 21 and 22 are mere matters of convenience and may not be used at all, simply the open ends of said tubes 14 being depended upon for conversational purposes.

While the exact dimensions are not of the essence of my invention, I have found that sections about four feet long, seven and one-half inches in diameter at the bottom, and enough larger at the top to make a good tele-

scoping connection with the next section are convenient of manipulation and efficient for the purpose of conveying cement or concrete to the bottom of deep excavations. The hopper may be three feet square, and all the parts should be located, proportioned, and arranged to readily and conveniently accomplish the purposes intended.

So far as some features of my invention are concerned, the special form and arrangement of hopper and spout is immaterial, for any kind that will accomplish the work may be used. Two cables, one on each side, may be employed, if necessary or preferred; but one is more satisfactory, as easily allowing the lower end of the conveyer to be swung about in any desired direction. The rope or cable may, if preferred and so far as some of my claims are concerned, have stop bolts or pins or other enlargements below the ear or lug of the lowest section only; but in this case the entire weight of the pipe will be borne by such lug or section, and the others would only derive lateral support from the cable. I prefer, however, the construction shown and described. Wherever the term "cable" is used in the claims it is intended as a generic word to cover any like means, as a wire, rope, chain, &c.

The iron of which the sections of the conveyer are made may be galvanized to guard against rust.

It will be observed that an important feature lies in so connecting the sections of the conveyer that they may be detached independently, whereby the conveyer may be lengthened or shortened by attaching additional sections or removing one or more of the attached sections. By this arrangement the sections may all be made of the same size and of a minimum diameter. It will be noted also that the joints between the sections are closed tight and that they are rigid—*i. e.*, non-flexible—so that in moving the conveyer about in the excavation the entire conveyer moves bodily. The rigid but detachable joints between the joints are most conveniently formed by tapering the sections, so that the smaller end of each will partially telescope into the larger end of the adjacent section and make a rigid close joint therewith; but it is obvious that any other means for making a detachable joint may be resorted to without departing from the invention.

Although I have described the invention with particular reference to the details of construction, I would have it understood that it is not to be limited thereto, as various changes, alterations, modifications, and substitutions may be made therein and still come within its purview; but

What I do claim, and desire to secure by Letters Patent, is—

1. In an apparatus of the class set forth, the combination of a conveyer consisting of a series of hollow cylindrical sections telescoped partially into each other at their adjacent ends and having rigid, close joints at each of said telescopic connections, a supporting-cable detachably attached to each of said sections, means for raising and lowering said supporting-cable and the attached conveyer, and means detachably connected to the topmost section for introducing the material to be conveyed into said topmost section, whereby the conveyer may be swung about at its lower end without pivotal or telescopic action at the joints and may be extended by the addition of sections to or shortened by the removal of sections from the upper end of the conveyer.

2. In an apparatus of the class described, the combination of a conveyer consisting of a series of hollow cylindrical sections having the same diameter and tapered to telescope partially into each other at their adjoining ends, these joints being rigid but detachable, a supporting-cable attached to the lowermost section of the conveyer and adapted thereby to support the entire conveyer, means for detachably connecting the remaining sections to the cable, whereby said sections may be removed one by one from the upper end of the conveyer as the conveyer is bodily raised, means for bodily raising and lowering the conveyer, and a hopper having a spout detachably connected to the topmost section of the conveyer, for the purposes set forth.

3. In an apparatus of the class set forth, the combination of a conveyer consisting of a series of hollow cylindrical sections detachably connected together and having closed rigid joints at their adjoining ends, a supporting-cable and means for connecting it to the lowermost section and detachably to the remaining sections, means for raising and lowering said cable and the attached sections, and means detachably connected to the topmost sections for depositing the material to be conveyed thereinto, for the purposes set forth.

4. In a device of the class described, the combination with a conveyer composed of separate sections, with telescoping joints, a slotted ear on each section, a cable passing through the slots of all the ears, a latch on each ear to confine the cable in the slot, means such as an enlargement of the cable beneath the several ears to prevent the same from drawing through said ears, and a windlass upon which the cable may be wound to raise and lower the conveyer.

5. In a device of the class described, the combination, with a conveyer composed of separately-detachable sections rigidly connected together and having their ends telescoped into each other to make a tight joint and enable the conveyer to be shifted bodily laterally and vertically, means for raising and lowering the conveyer, and means for depositing the material to be conveyed into the upper end of the conveyer.

6. In a device of the class described, the combination with a conveyer composed of independently detachable and attachable sections, a spout fitting into the top of the upper section, a hopper connected with the other end of the spout, a cable supporting said conveyer, a windlass or drum about which the said cable is wound to hoist or lower the conveyer, and means to permit said spout to fit within the said top section of the conveyer in the different positions of the conveyer determined by the wrapping of the cable upon, or its unwrapping from, the said windlass or drum.

7. In a device of the class described, the combination with a conveyer composed of independently-detachable partially-telescoped sections, a spout fitting into the top section, a hopper connected with the other end of the spout, a cable supporting said conveyer, a drum about which the said cable is wound to hoist or lower the conveyer, said spout being made extensible by telescoping sections and provided with a rotatable connection with the hopper.

8. In combination with a series of depending supporting-sections detachably connected together, means for raising and lowering said sections and supporting them, of sections of a speaking-tube secured respectively to the sections of said support and adapted to register and connect when said supporting-sections are put together, as and for the purposes set forth.

9. In a device of the class described, the combination with conveyer-sections having slotted lugs or ears, speaking-tube sections secured to said conveyer-sections in similar relation to the said lugs or ears, a cable passing through said lugs or ears to support the conveyer-sections, the said tube-sections registering with each other when the conveyer is so built up.

Signed by me at Chicago, Cook county, Illinois, this 25th day of May, 1901.

WILLIAM W. MONTGOMERY.

Witnesses:
MARY MCFATRICH,
THOMAS H. MONTGOMERY.

CLOSE IN CENTER

338–339

No. 714,150

Patented Nov. 25, 1902.

P. B. CLARKE.

APPARATUS FOR HANDLING MATERIAL IN BULK.

(Application filed Jan. 26, 1901.)

(No Model.)

31 Sheets—Sheet 1.

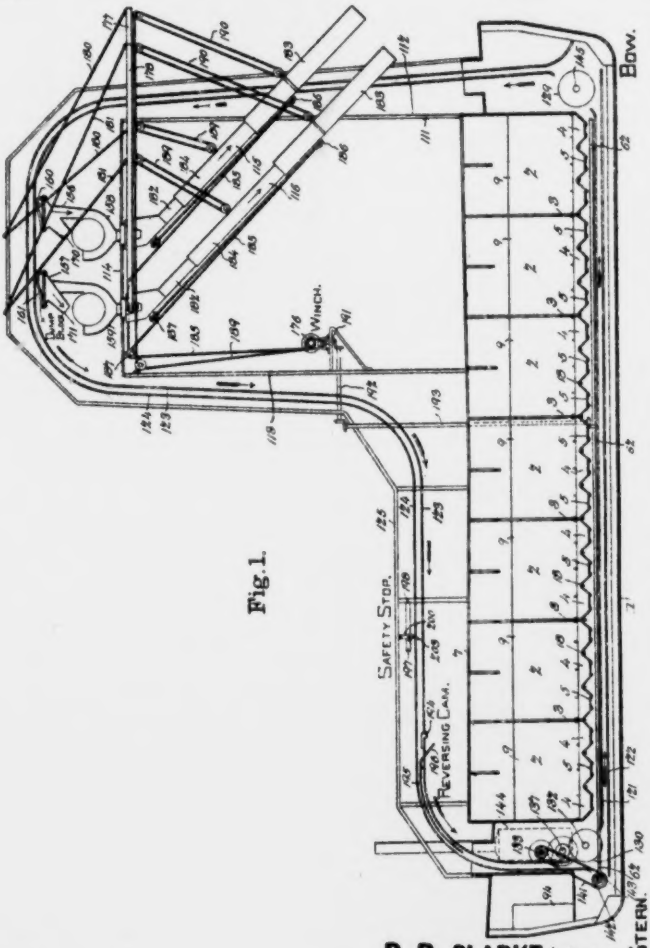


Fig. 1.

Witnesses
E. F. Stewart.
H. F. Riley

P. B. CLARKE Inventor
By Cl. Brown & Co.
Attorneys

340–341

No. 714,150. Patented Nov. 25, 1902.

P. B. CLARKE.

APPARATUS FOR HANDLING MATERIAL IN BULK.

(Application filed Jan. 26, 1901.)

(No Model.) 31 Sheets—Sheet 2.

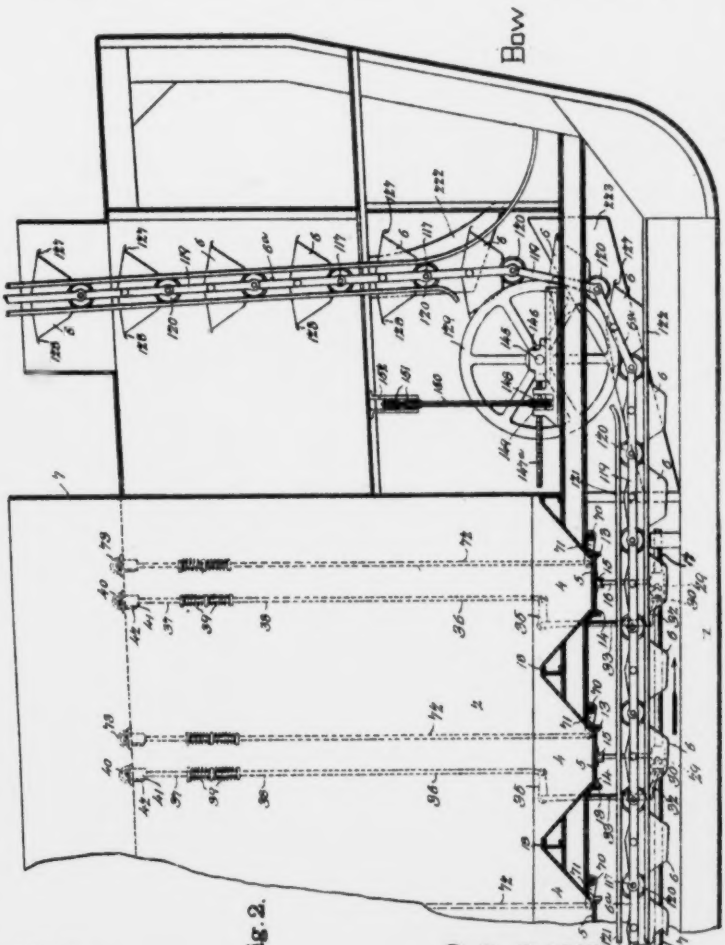


Fig. 2.

Witnesses
E. F. Stewart
J. F. Riley

Inventor
P. B. CLARKE
By C. A. Snow & Co.
Attorneys

342-343

No. 714,150. Patented Nov. 25, 1902.

P. B. CLARKE.

APPARATUS FOR HANDLING MATERIAL IN BULK.

(Application filed Jan. 26, 1901.)

(No Model.) 31 Sheets—Sheet 3.

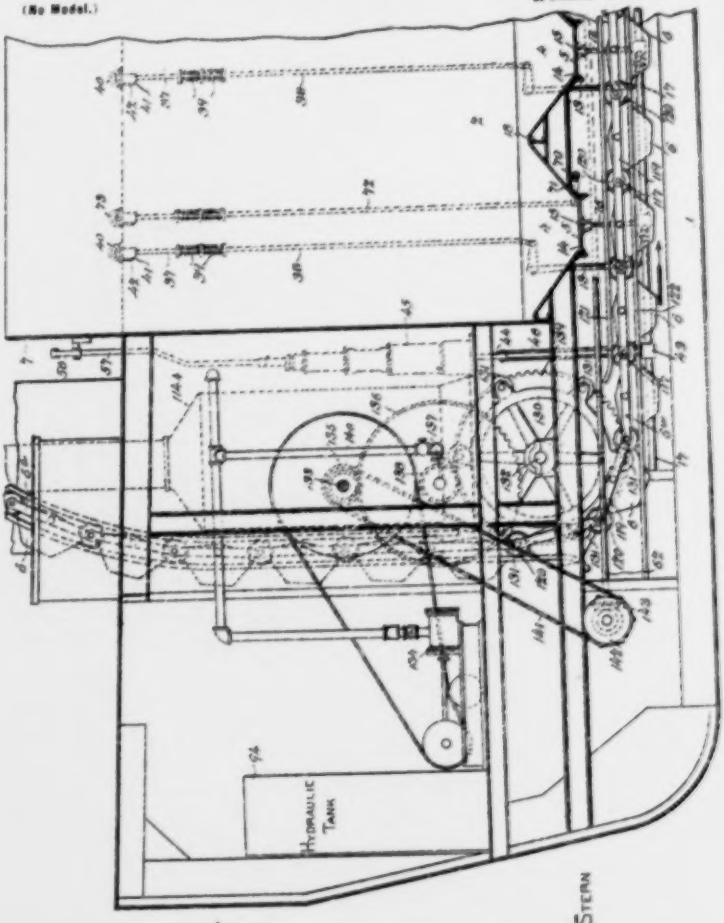


Fig. 3.

Witnesses
C. F. Gould
H. A. Riley

P. B. CLARKE Inventor
By Crosby & Co.
Attorneys

344-345

No. 714,150. Patented Nov. 25, 1902.

P. B. CLARKE.

APPARATUS FOR HANDLING MATERIAL IN BULK.

(Application filed Jan. 28, 1901.)

(No Model.) 31 Sheets—Sheet 4.

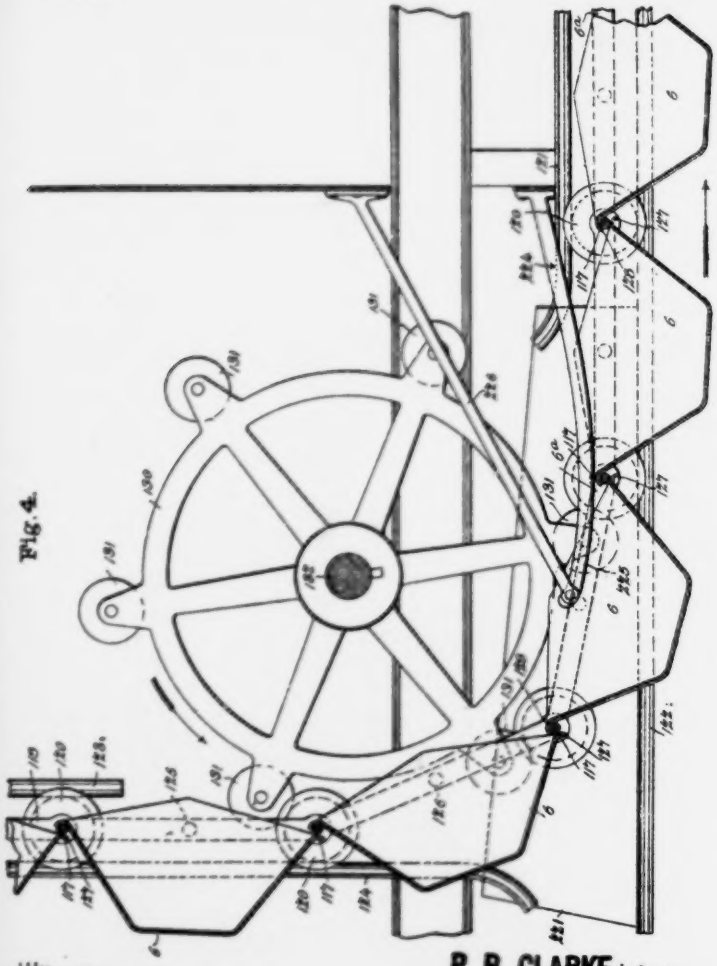


Fig. 4.

Witnesses

P. B. CLARKE Inventor

By C. A. Snow & Co. Attorneys

346

346-347

No. 714,150. Patented Nov. 25, 1902.

P. B. CLARKE.

APPARATUS FOR HANDLING MATERIAL IN BULK.

Application filed Jan. 28, 1901.

(No Model.) 31 Sheets—Sheet 5

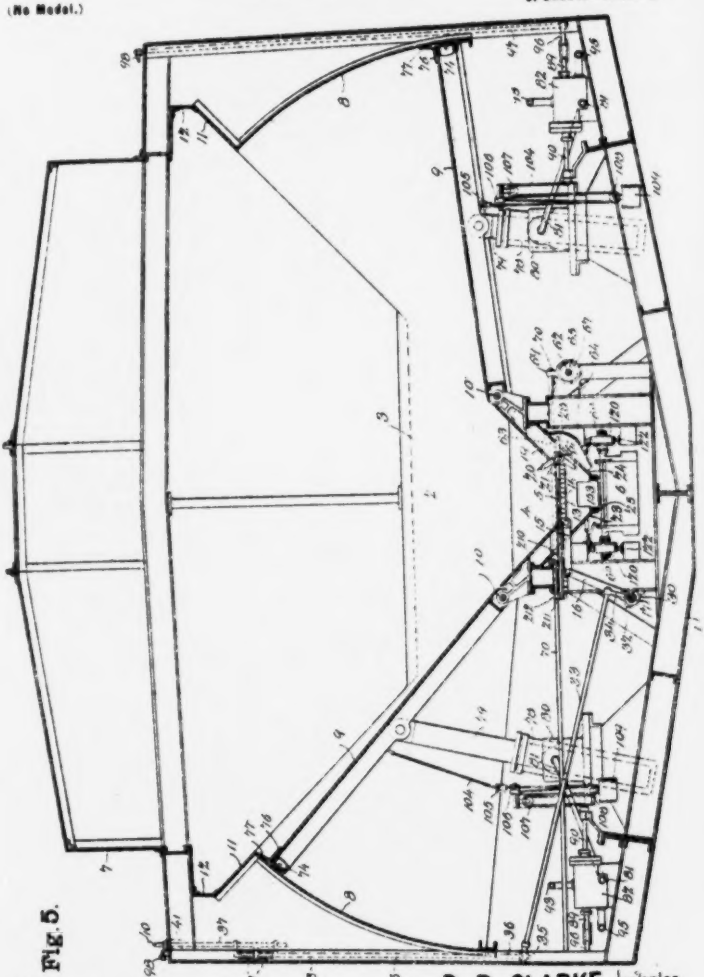


Fig. 5.

Witnesses
E. F. Stewart
H. C. Riley

Inventor
P. B. CLARKE
By Cachow & Co.
Attorneys

348-349

No. 714,150. Patented Nov. 25, 1902.

P. B. CLARKE.

APPARATUS FOR HANDLING MATERIAL IN BULK.

(Application filed Jan. 26, 1901.)

(No Model.) 31 Sheets—Sheet 6.

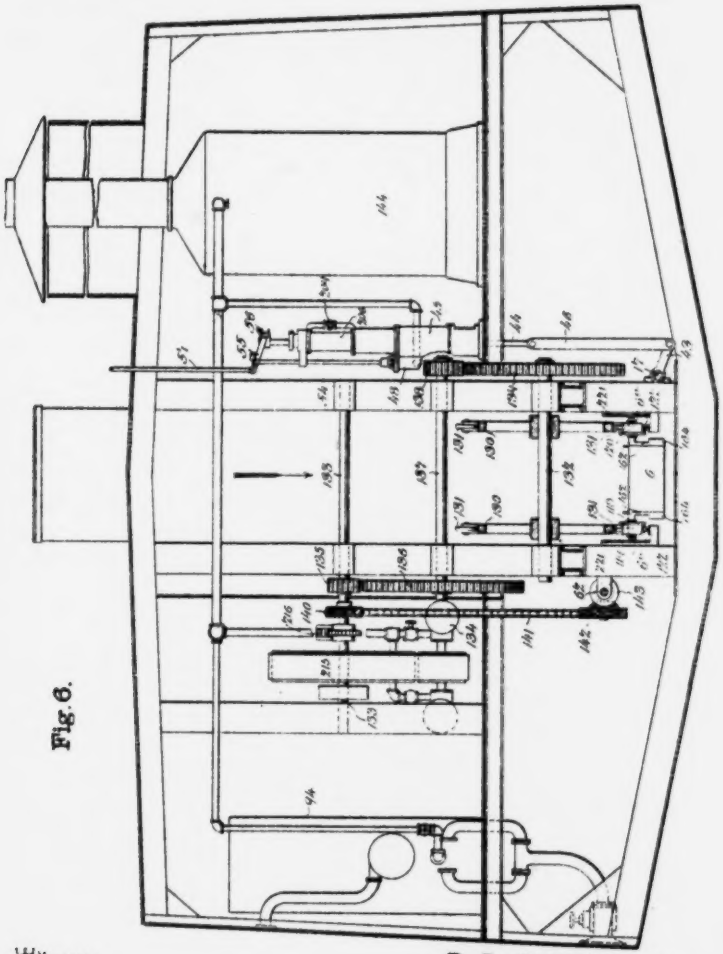


Fig. 6.

Witnesses
E. F. Stewart
H. H. Riley

P. B. CLARKE Inventor
By C. A. Snow & Co.
Attorneys

748

350–351

No. 714,150

Patented Nov. 25, 1902.

P. B. CLARKE.

APPARATUS FOR HANDLING MATERIAL IN BULK.

Application filed Jan 26, 1901.

(No Model.)

3 Sheets—Sheet 7

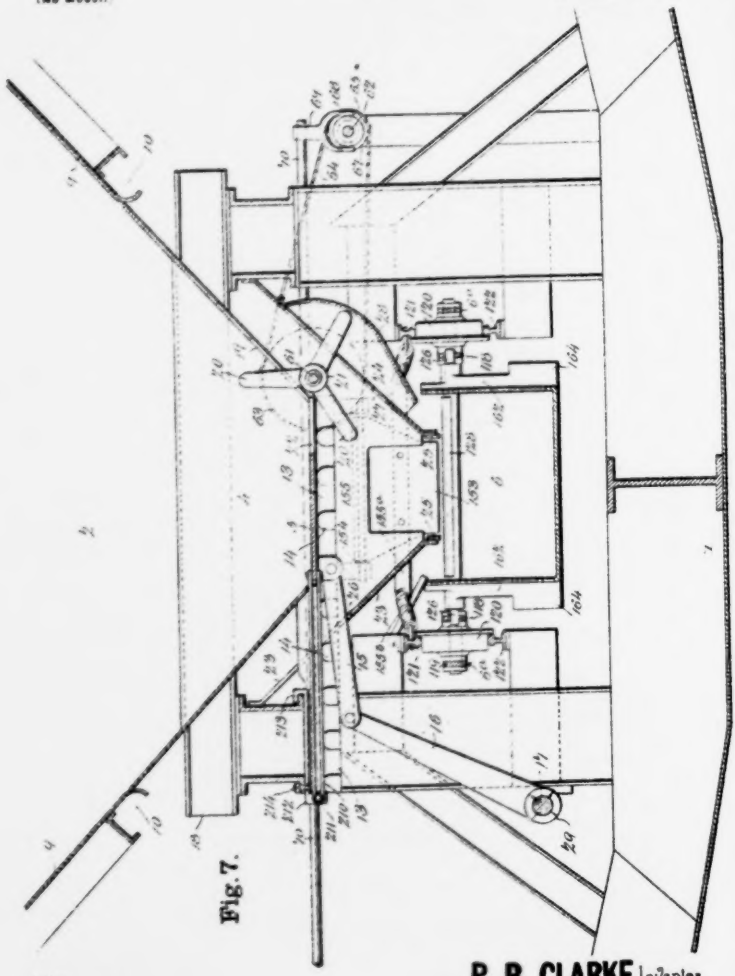


Fig. 7.

Witnesses

P. B. CLARKE Inventor

By C. A. Snow & Co.

Attorneys

729

352–353

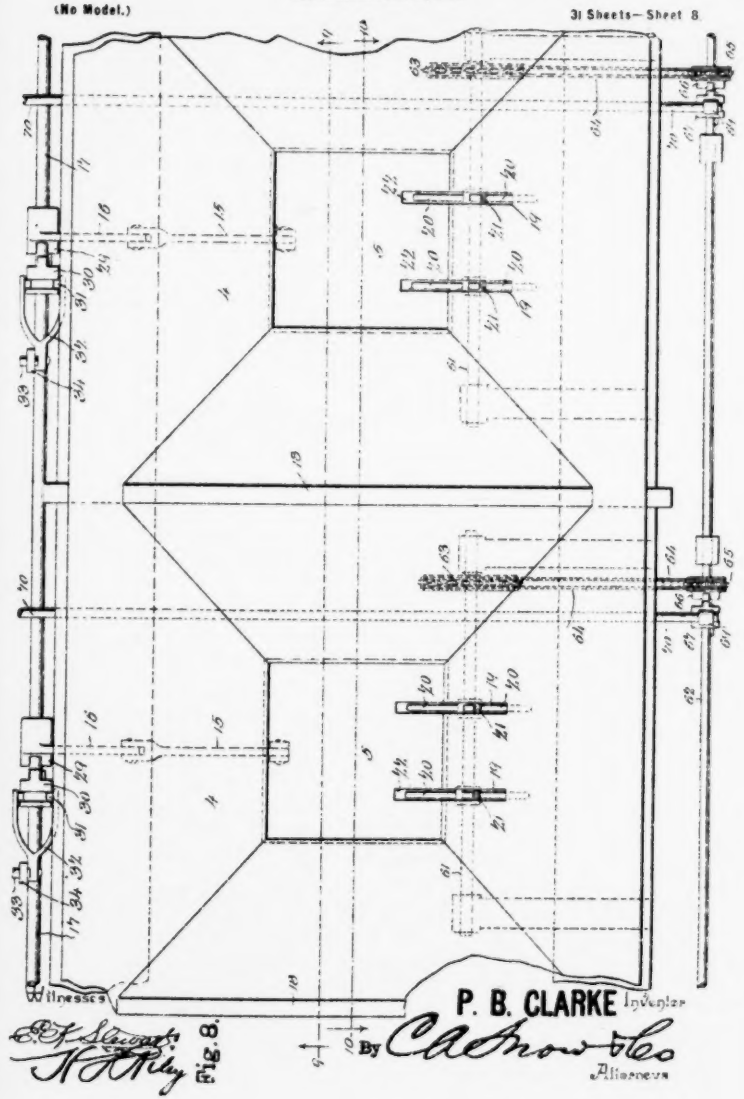
No. 714,150. Patented Nov. 25, 1902.

P. B. CLARKE.

APPARATUS FOR HANDLING MATERIAL IN BULK.

Application filed Jan. 28, 1901.

(No Model.) 31 Sheets—Sheet 8.



Witnesses

E. F. Stewart

H. Riley

Fig. 8.

P. B. CLARKE Inventor

By C. A. Snow & Co.

Attorneys

750

354-355

No. 714,150. Patented Nov. 25, 1902.

P. B. CLARKE.

APPARATUS FOR HANDLING MATERIAL IN BULK.

Application filed Jan. 26, 1901.

(No Model.) 31 Sheets—Sheet 9.

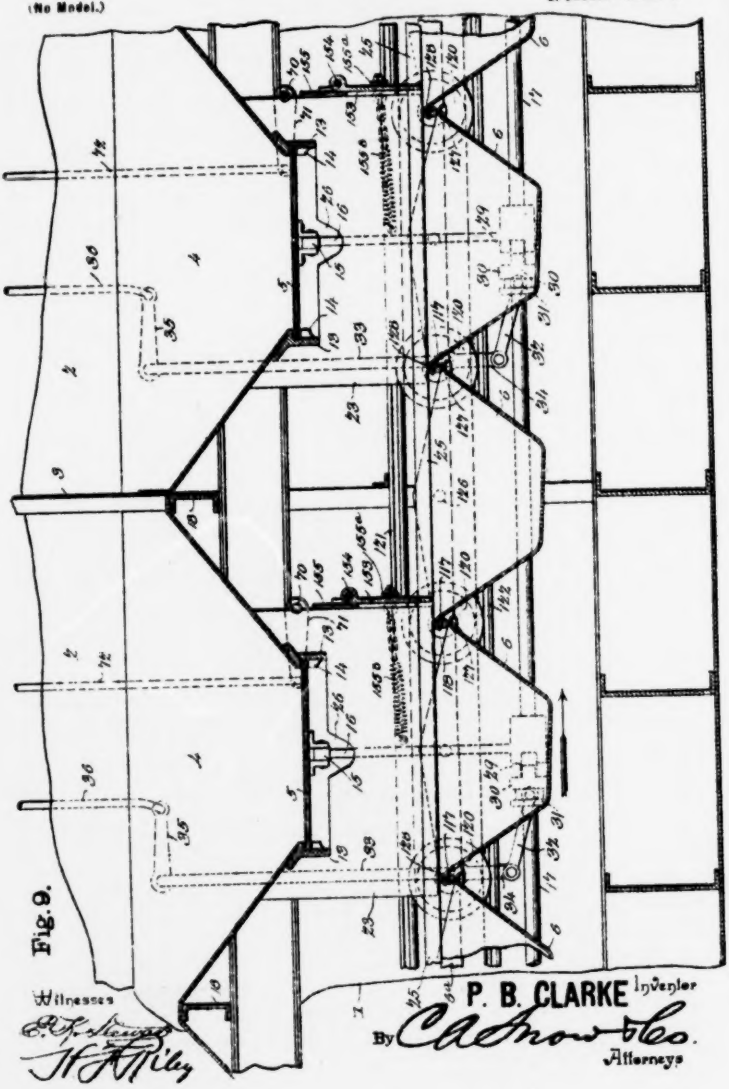


Fig. 6.

Witnesses
E. F. Stanley
H. F. Riley

Inventor
P. B. CLARKE
By Cadwallader & Co.
Attorneys

356-357

No. 714,150. Patented Nov. 25, 1902.

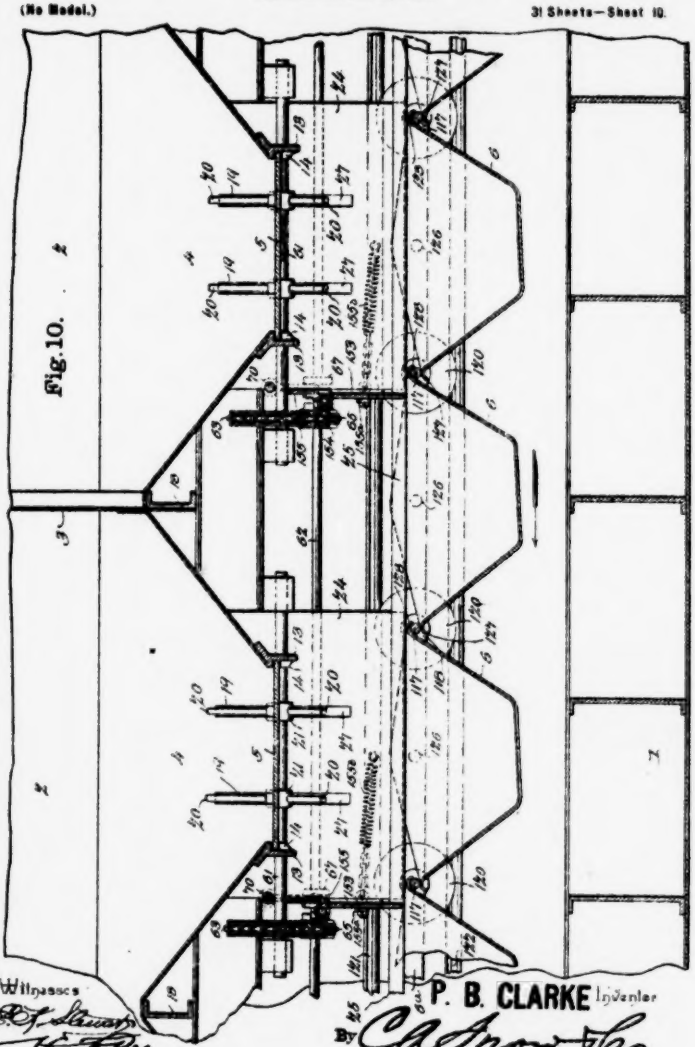
P. B. CLARKE.

APPARATUS FOR HANDLING MATERIAL IN BULK.

(Application filed Jan. 28, 1901.)

(No Model.) 31 Sheets—Sheet 10.

Fig. 10.



Witnesses:
E. F. Lawall
H. E. Riley

Inventor
P. B. CLARKE
By C. A. Snow & Co.
Attorneys

752

358–359

No. 714,150. Patented Nov. 25, 1902.

P. B. CLARKE.

APPARATUS FOR HANDLING MATERIAL IN BULK.

(Application filed Jan. 28, 1901.)

(No Model.) 31 Sheets—Sheet 11.

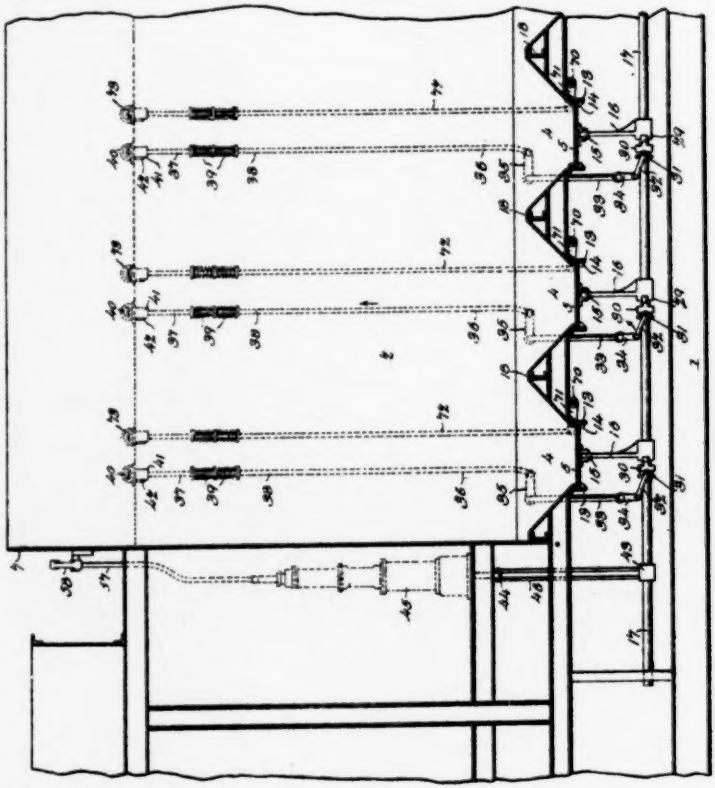


Fig. 11.

Witnesses
E. C. Stewart
H. F. Riley

P. B. CLARKE Inventor
By C. A. Snow & Co.
Attorneys

753

360–361

No. 714,150. Patented Nov. 25, 1902.

P. B. CLARKE.

APPARATUS FOR HANDLING MATERIAL IN BULK.

(Application filed Jan. 26, 1901.)

(No Model.) 31 Sheets—Sheet 12.

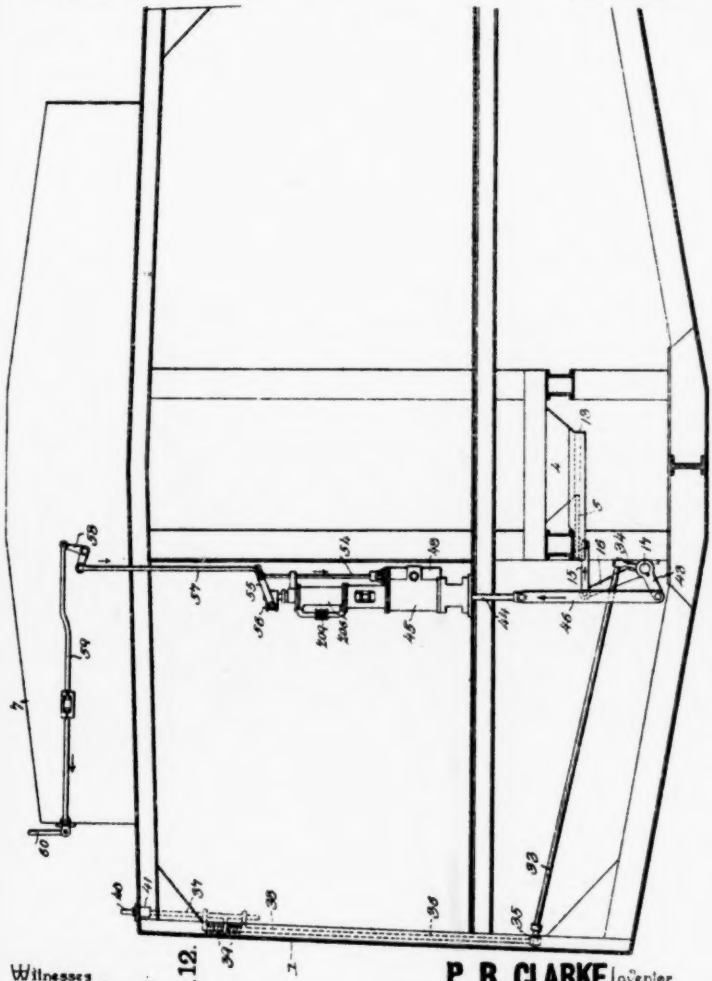


Fig. 12.

Witnesses
R. F. Gaynor
H. R. Riley

P. B. CLARKE Inventor
By C. A. Snow & Co
Attorneys

754

362-363

No. 714,150. Patented Nov. 25, 1902.

P. B. CLARKE.

APPARATUS FOR HANDLING MATERIAL IN BULK

Application filed Jan. 26, 1901.

(No Model.) 31 Sheets—Sheet 13.

Fig. 13.

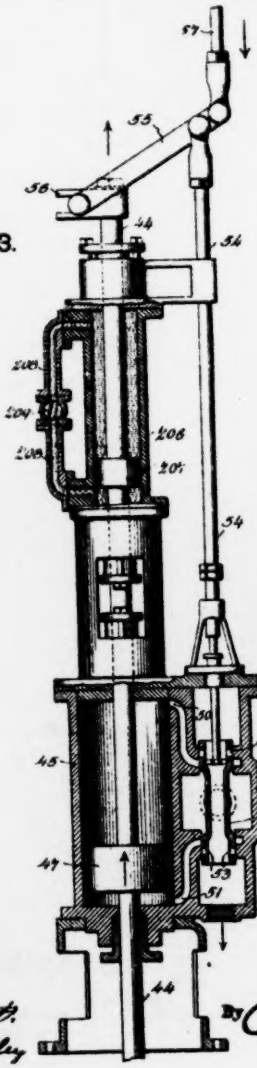
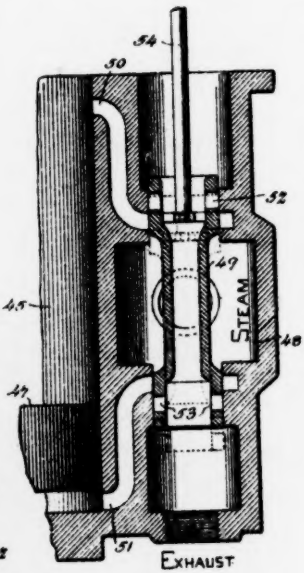


Fig. 14.



Witnesses
E. F. Stewart
H. A. Riley

P. B. CLARKE Inventor
By Cachow & Co.
Attorneys

364-365

No. 714,150. Patented Nov. 25, 1902.

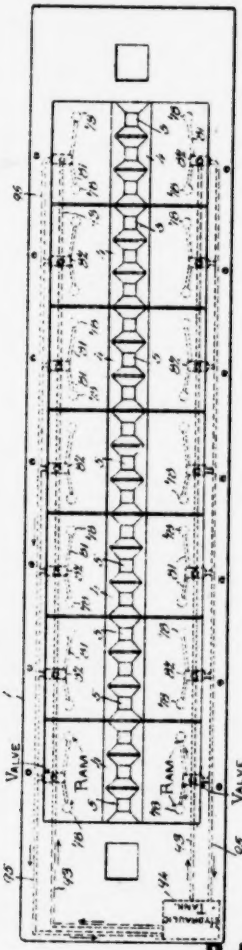
P. B. CLARKE.

APPARATUS FOR HANDLING MATERIAL IN BULK.

Application filed Jan. 26, 1901.

(No Model.) 31 Sheets—Sheet 14.

Fig. 15



Witnesses
C. F. Stewart
H. J. Riley

P. B. CLARKE Inventor
By C. A. Snow & Co.
Attorneys

256

366-367

No. 714,150. Patented Nov. 25, 1902.

P. B. CLARKE.

APPARATUS FOR HANDLING MATERIAL IN BULK.

Application filed Jan. 26, 1901.

(No Model.) 31 Sheets—Sheet 15.

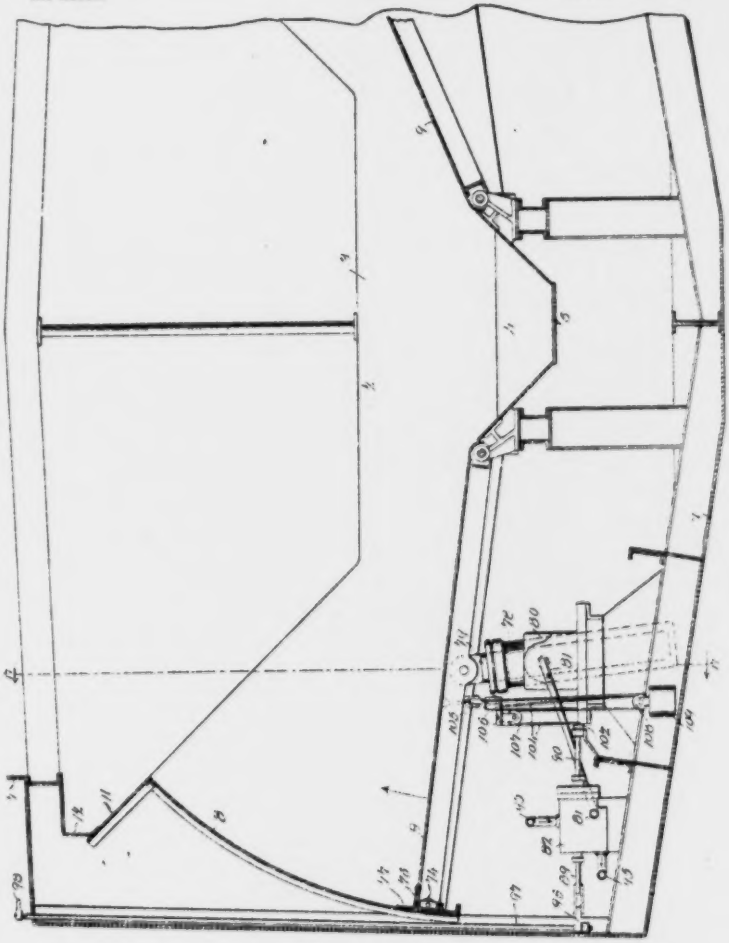


Fig. 16.

Witnesses
E. F. Lewis
H. K. Ploy

P. B. CLARKE Inventor
By C. A. Snow & Co.
Attorneys

368-369

No. 714,150 Patented Nov. 25, 1902.

P. B. CLARKE.

APPARATUS FOR HANDLING MATERIAL IN BULK.

Application filed Jan. 20, 1901.

(No Model.) 31 Sheets—Sheet 16.

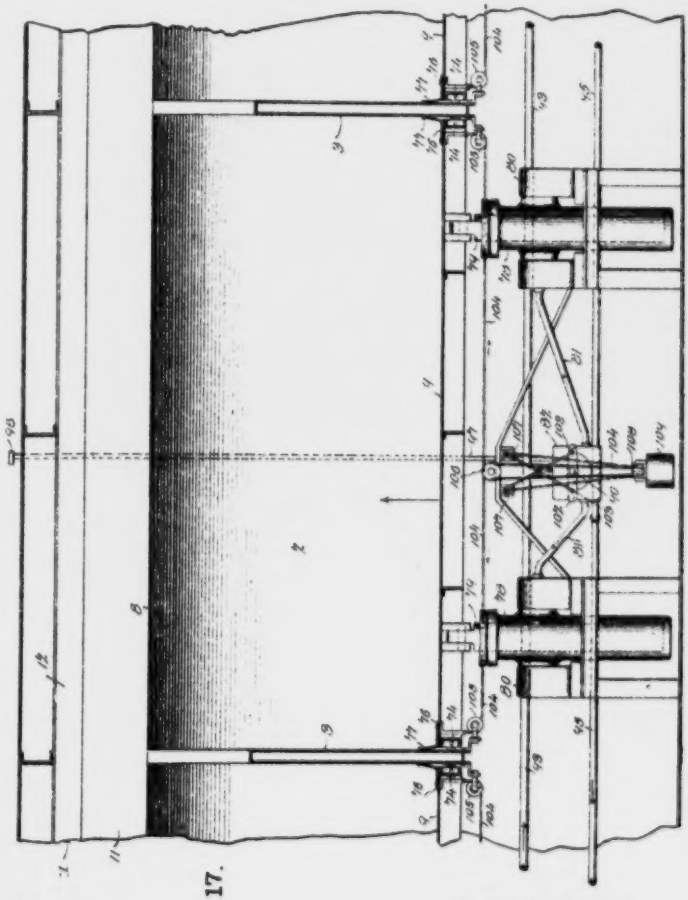


Fig. 17.

Witnesses
E. F. Stewart
H. T. Riley

P. B. CLARKE Inventor
By C. A. Snow & Co.
Attorneys

370-371

No. 714,150. Patented Nov. 25, 1902.

P. B. CLARKE.

APPARATUS FOR HANDLING MATERIAL IN BULK.

(Application filed Jan. 28, 1901.)

(No Model.) 31 Sheets—Sheet 17.

Fig. 19.

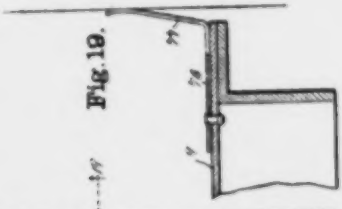
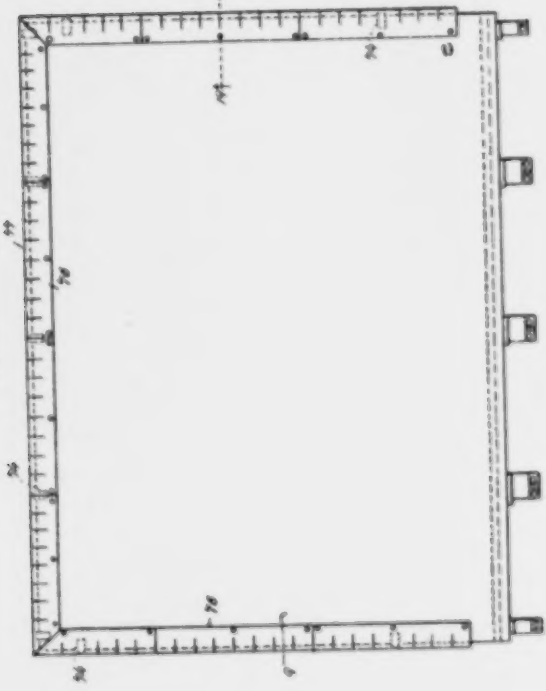


Fig. 18.



Witnesses
E. F. Stewart
H. C. Riley

P. B. CLARKE Inventor
By C. A. Snow & Co.
Attorneys

259

372-373

No. 714,150 Patented Nov. 25, 1902.

P. B. CLARKE.

APPARATUS FOR HANDLING MATERIAL IN BULK.

Application filed Jan. 26, 1901.

(No Model.)

31 Sheets—Sheet 18

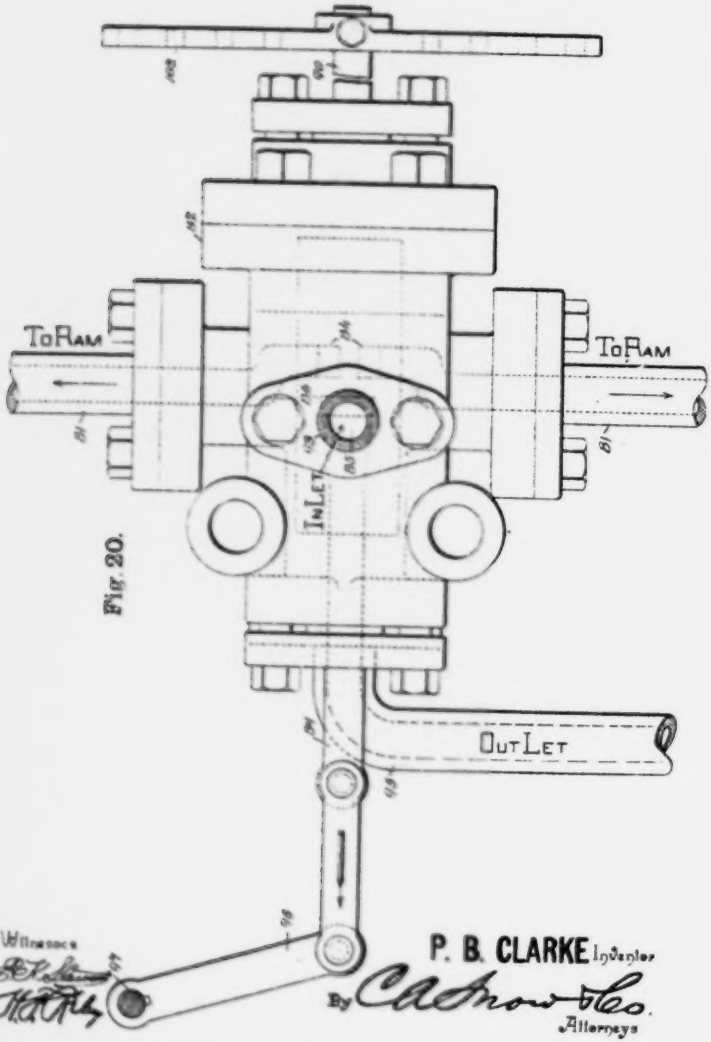


Fig. 20.

Witnesses

P. B. CLARKE Inventor

By Cachow & Co.

Attorneys

760

374-375

No. 714,150. Patented Nov. 25, 1902.

P. B. CLARKE.

APPARATUS FOR HANDLING MATERIAL IN BULK.

Application filed Jan. 26, 1901.

(No Model.) 31 Sheets—Sheet 19.

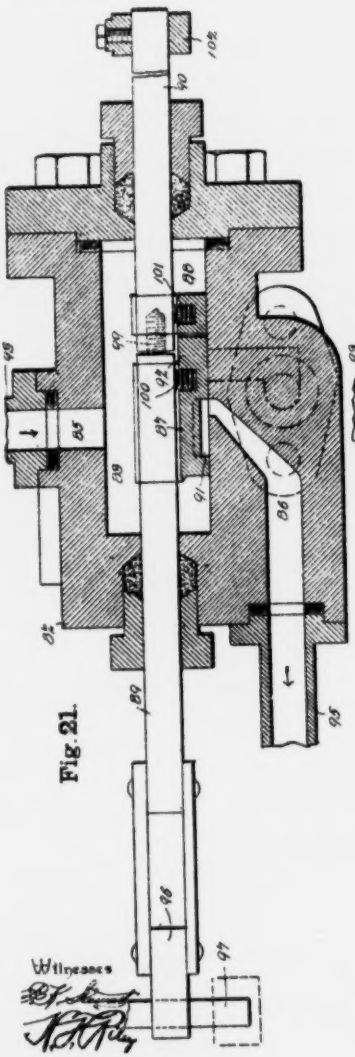


Fig. 21.

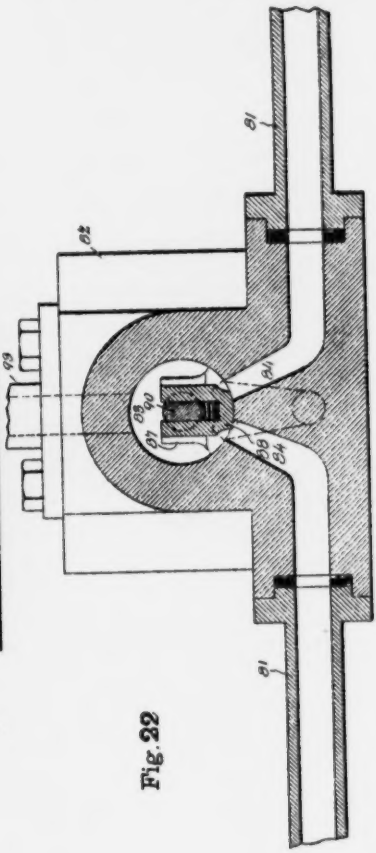


Fig. 22.

Witnesses

P. B. CLARKE Inventor

By C. A. Snow & Co. Attorneys

761

376-377

No. 714,150. Patented Nov. 25, 1902.

P. B. CLARKE.

APPARATUS FOR HANDLING MATE L IN BULK.

(Application filed Jan. 26, 1901.)

(No Model.) 31 Sheets—Sheet 20.

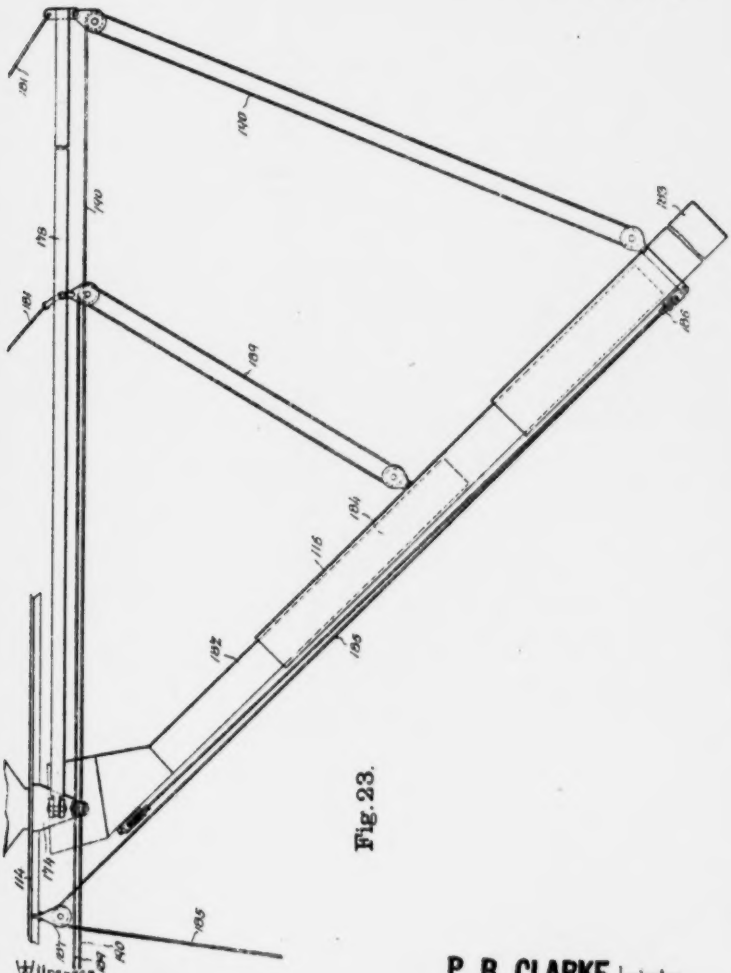


Fig. 23.

Witnesses:
E. F. Stewart
H. J. Riley

P. B. CLARKE Inventor
By Cushman & Co.
Attorneys

762

378–379

No. 714,150. Patented Nov. 25, 1902.

P. B. CLARKE.

APPARATUS FOR HANDLING MATERIAL IN BULK.

Application filed Jan. 28, 1901.

(No Model.) 31 Sheets—Sheet 21.

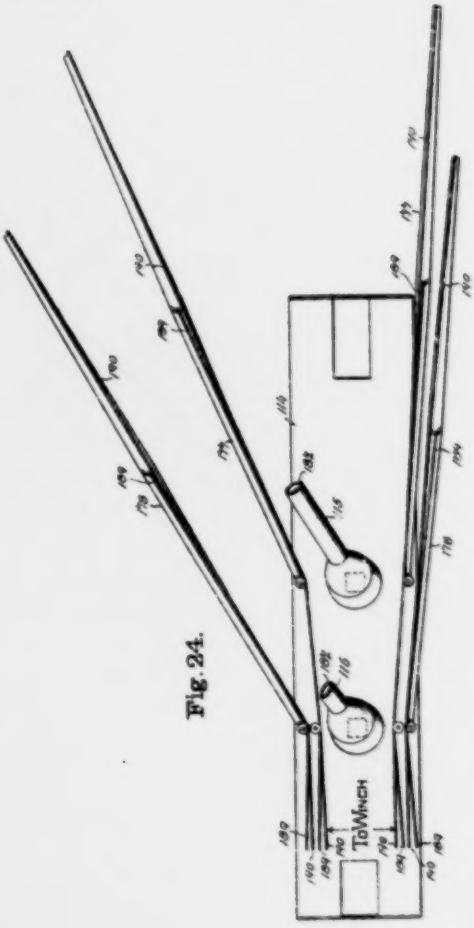


Fig. 24.

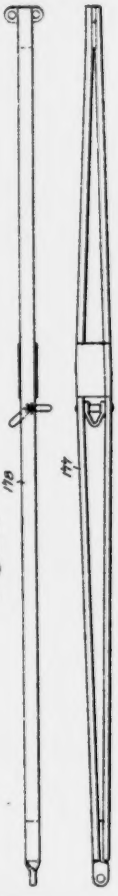


Fig. 25.

Fig. 26.

Witnesses
C. Pickard
H. C. Riley

P. B. CLARKE Inventor
By C. A. Snow & Co.
Attorneys

768

No. 714,150. Patented Nov. 25, 1902.

P. B. CLARKE.

APPARATUS FOR HANDLING MATERIAL IN BULK.

Application filed Jan. 26, 1901.

(No Model.) 31 Sheets—Sheet 22.

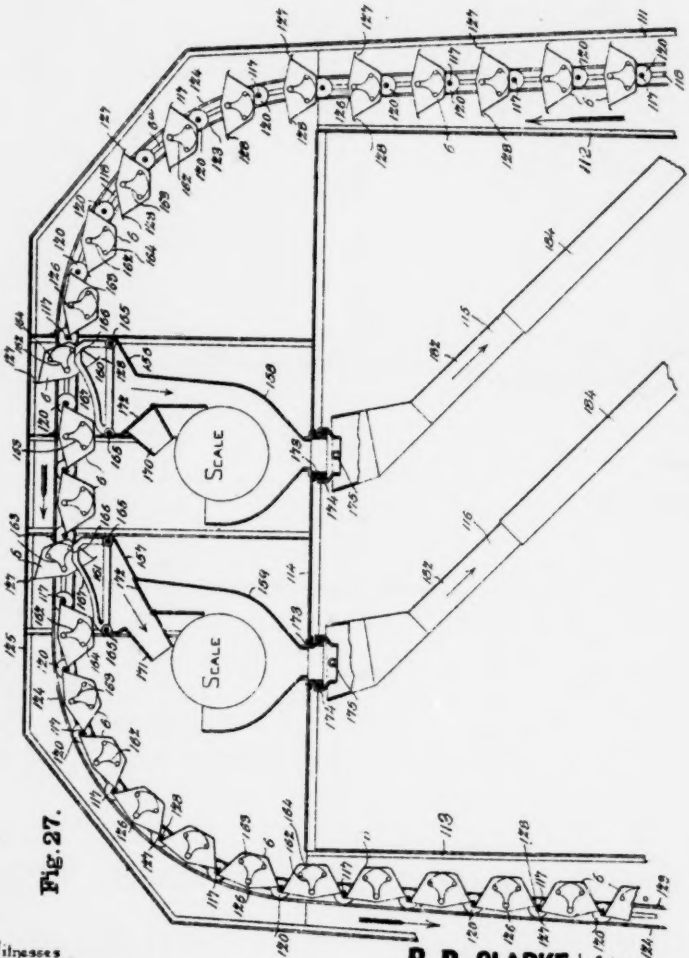


Fig. 27.

Witnesses
E. F. Stewart
H. A. Riley

P. B. CLARKE Inventor
By Cashow & Co.
Attorneys

764

382-383

No. 714,150

Patented Nov. 25, 1902.

P. B. CLARKE.

APPARATUS FOR HANDLING MATERIAL IN BULK.

Application filed Jan. 26, 1901.

(No Model.)

31 Sheets—Sheet 23.

Fig. 28.

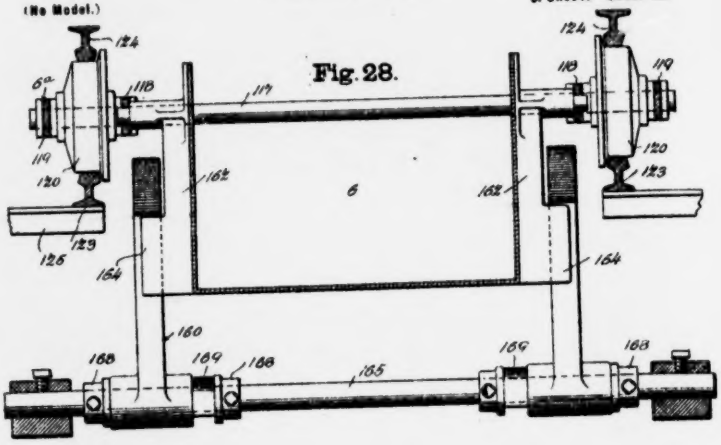
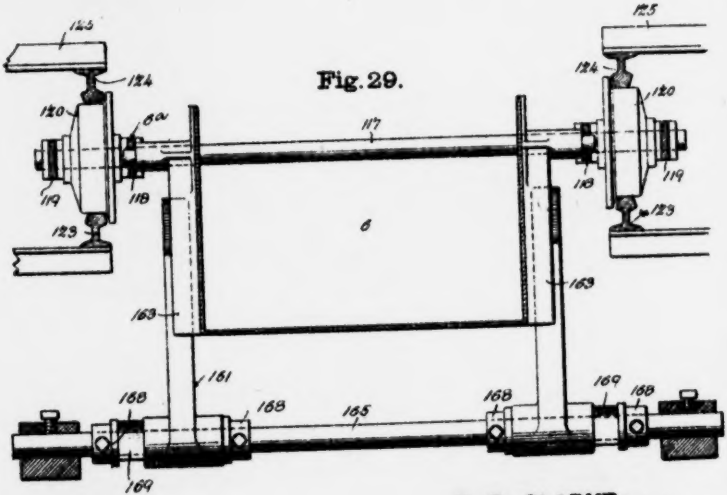


Fig. 29.



Witnesses

E. F. Stewart

H. F. Riley

P. B. CLARKE Inventor

By C. A. Snow & Co.

Attorneys

765

384-385

No. 714,150. Patented Nov. 25, 1902.

P. B. CLARKE.

APPARATUS FOR HANDLING MATERIAL IN BULK.

(Application filed Jan. 26, 1901.)

(No Model.) 31 Sheets—Sheet 24.

Fig. 30.

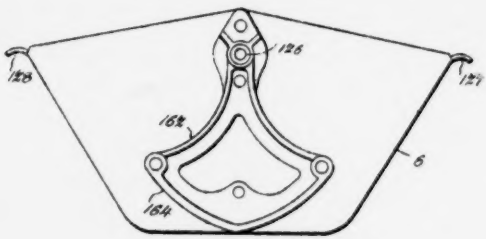


Fig. 31.

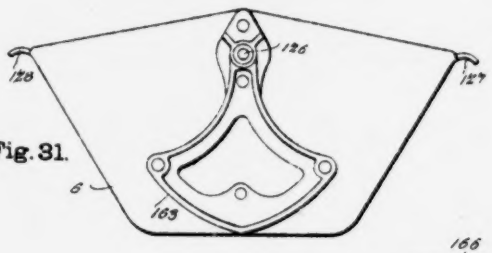


Fig. 32.

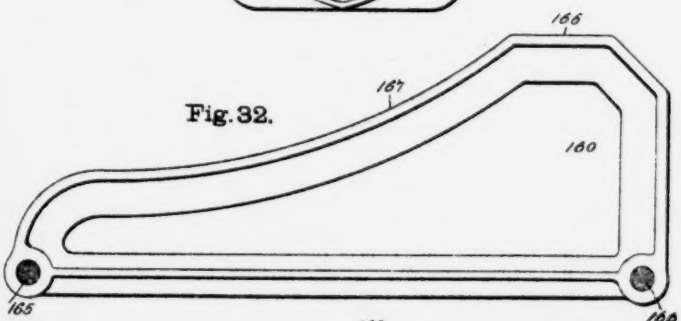
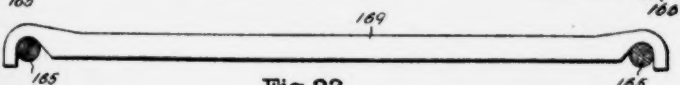


Fig. 33.



Witnesses

P. B. CLARKE Inventor

By C. A. Snow & Co. Attorneys

766

386-387

No. 714,150

Patented Nov. 25, 1902.

P. B. CLARKE.

APPARATUS FOR HANDLING MATERIAL IN BULK.

Application filed Jan. 26, 1901.

(No Model.)

31 Sheets—Sheet 25

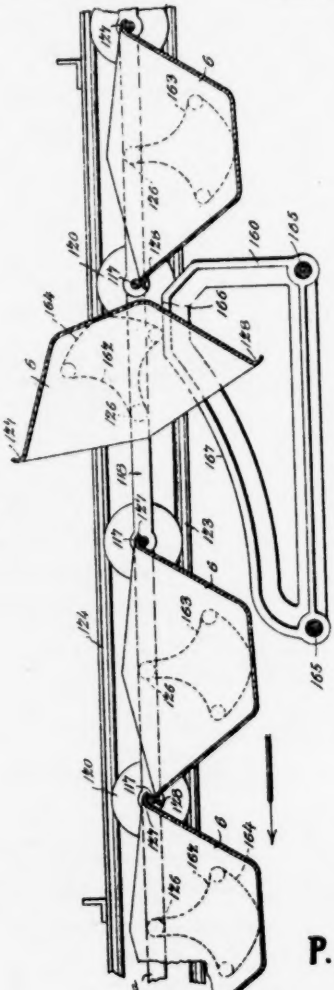


Fig. 34.

Witnesses
B. F. Stewart
H. A. Riley

P. B. CLARKE
Inventor
By Cabow & Co.
Attorneys

767

388–389

No. 714,150. Patented Nov. 25, 1902.

P. B. CLARKE.

APPARATUS FOR HANDLING MATERIAL IN BULK.

Application filed Jan. 26, 1901.

No Model.) 31 Sheets—Sheet 26.

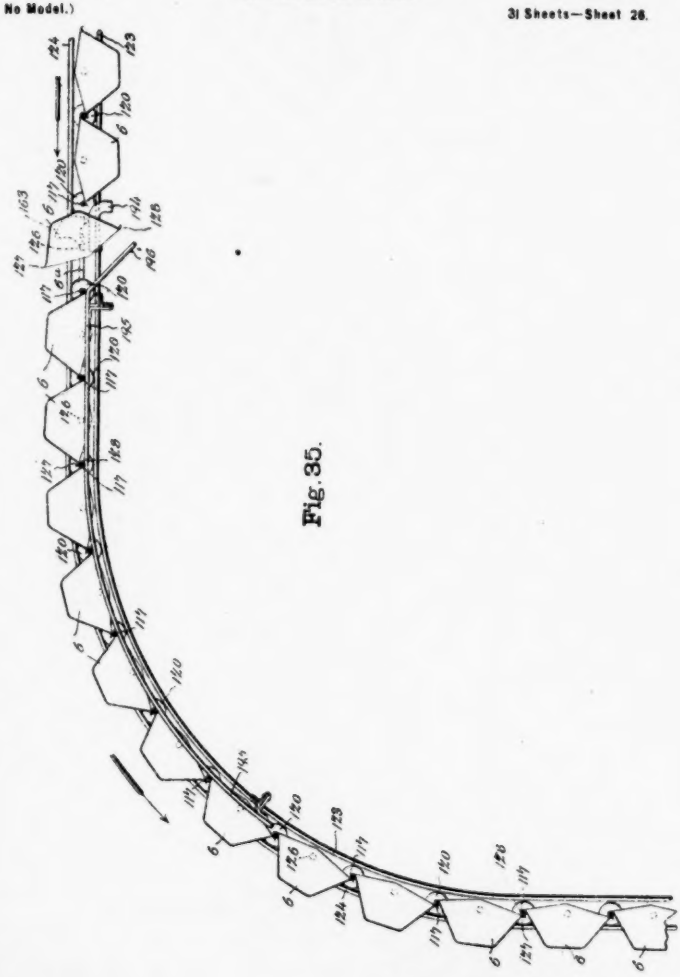


Fig. 35.

Witnesses

E. F. Stewart

T. J. Riley

P. B. CLARKE Inventor

By C. A. Snow & Co.

Attorneys

768

390-391

No. 714,150. Patented Nov. 25, 1902.

P. B. CLARKE.

APPARATUS FOR HANDLING MATERIAL IN BULK

(Application filed Jan. 28, 1901.)

(No Model.) 31 Sheets—Sheet 27

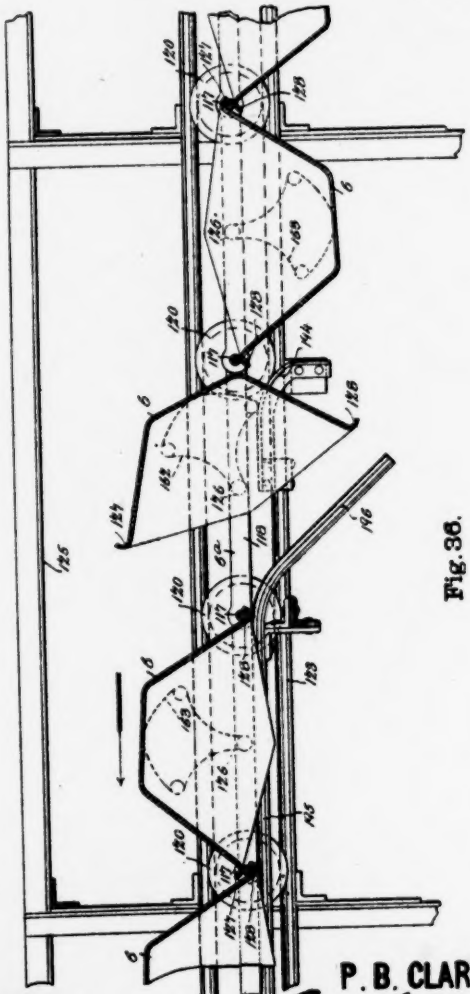


Fig. 36.

Witnesses

P. B. CLARKE Inventor

By Crosby & Co.

Attorneys

769

392–393

No. 714,150. Patented Nov. 25, 1902.

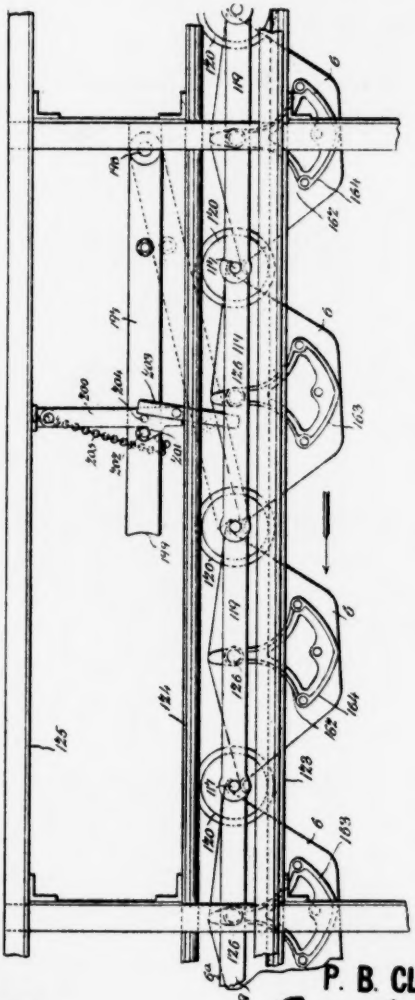
P. B. CLARKE.

APPARATUS FOR HANDLING MATERIAL IN BULK.

(Application filed Jan. 26, 1901.)

(No Model.) 31 Sheets—Sheet 28

Fig. 37.



Witnesses
E. F. Stewart
H. C. Riley

P. B. CLARKE Inventor
By C. A. Snow & Co.
Attorneys

770

394-395

No. 714,150. Patented Nov. 25, 1902.

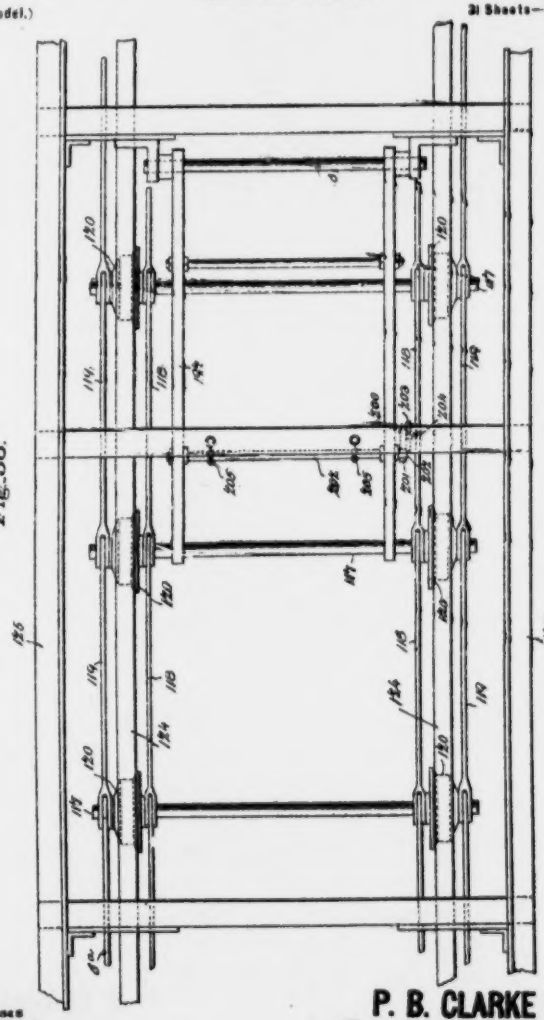
P. B. CLARKE.

APPARATUS FOR HANDLING MATERIAL IN BULK.

(Application filed Jan. 26, 1901.)

(No Model.) 21 Sheets—Sheet 29.

Fig. 38.



Witnesses
E. F. Stewart.
H. C. Riley

P. B. CLARKE Inventor
by Cushman & Co.
Attorneys

396-397

No. 714,150. Patented Nov. 25, 1902.

P. B. CLARKE.

APPARATUS FOR HANDLING MATERIAL IN BULK.

Application filed Jan. 29, 1901.

(No Model.) 31 Sheets—Sheet 30

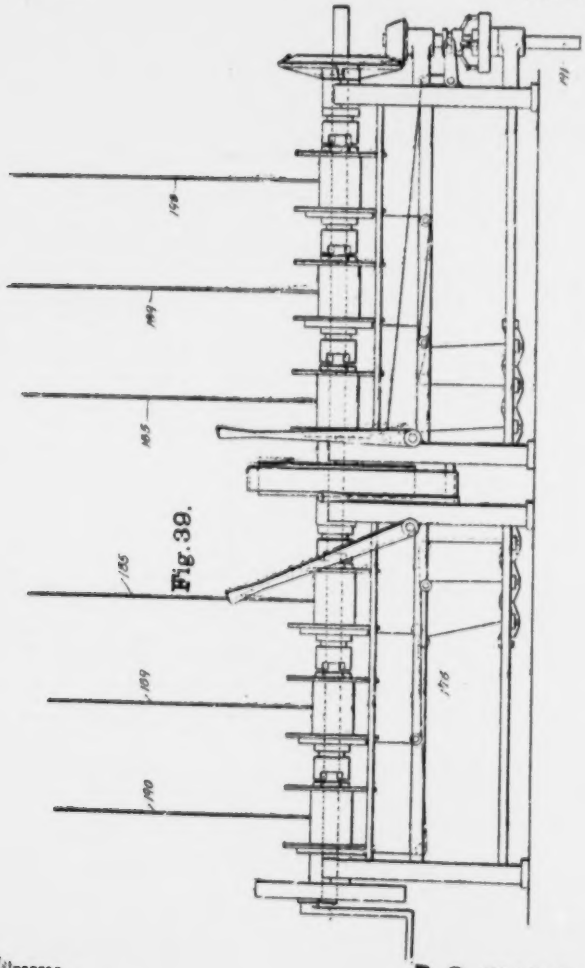


Fig. 39.

Witnesses
E. F. Lewis
H. A. Pilly

P. B. CLARKE Inventor
By C. A. Snow & Co.
Attorneys

398

No. 714,150. Patented Nov. 25, 1902.

P. B. CLARKE.

APPARATUS FOR HANDLING MATERIAL IN BULK.

Application filed Jan. 28, 1901.

(No Model.) 31 Sheets—Sheet 31.

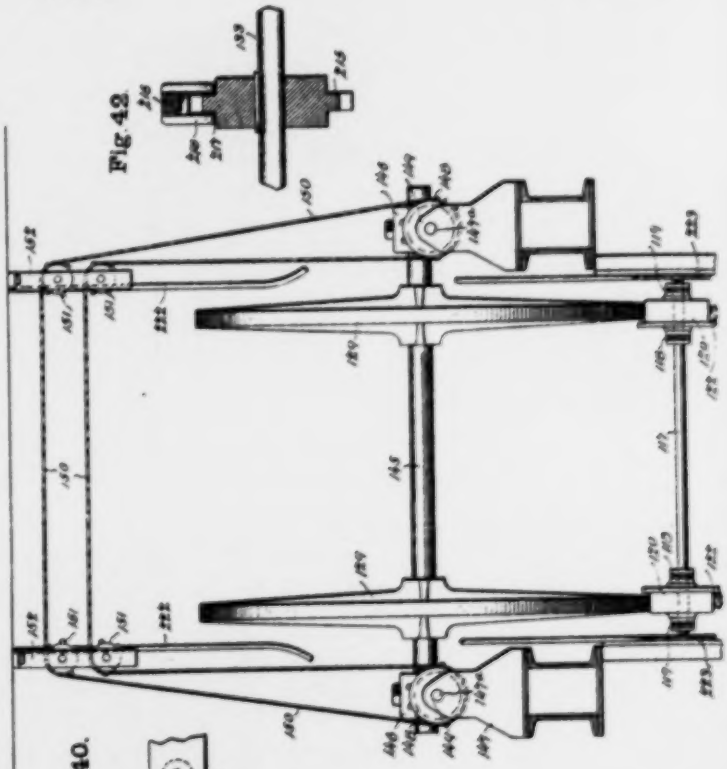


Fig. 42.

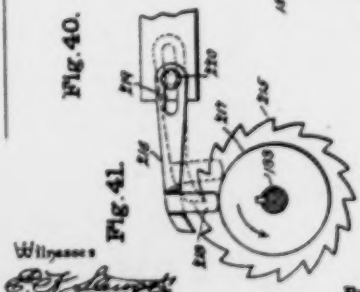


Fig. 40.

Fig. 41.

Witnesses:

P. B. CLARKE Inventor

By Cabrow & Co.

Attorneys

UNITED STATES PATENT OFFICE.

PEETE B. CLARKE, OF NEW YORK, N. Y.

APPARATUS FOR HANDLING MATERIAL IN BULK.

SPECIFICATION forming part of Letters Patent No. 714,150, dated November 25, 1902.

Application filed January 28, 1901. Serial No. 44,778. (No model.)

To all whom it may concern:

Be it known that I, PEETE B. CLARKE, a citizen of the United States, residing at New York, in the county of New York and State of New York, have invented a new and useful Apparatus for Handling Material in Bulk, of which the following is a specification.

The invention relates to improvements in apparatus for handling material in bulk.

The object of the present invention is to improve the construction of apparatus for handling material in bulk and to provide an apparatus of this character designed for loading vessels at a wharf or offshore, and particularly for supplying such vessels with coal, and adapted to be applied to a barge or analogous vessel and capable of rapidly transferring the contents of the same to the vessel to be loaded and of simultaneously weighing the material.

Another object of the invention is to provide adjustable and extensible chutes adapted to be turned in any direction and to be arranged at any desired position at either side of the barge and capable of being readily handled to change them from one position to another to enable the material to be delivered in the desired quantities to different portions of a vessel.

Furthermore, the invention has for its object to provide means for automatically dumping the contents of the buckets of the conveyer into the chutes and for automatically reversing the buckets, so that they will reënter the barge in proper position for receiving another charge.

Furthermore, the invention has for its object to provide a safety-stop for automatically locking the conveyer against backward movement to prevent the loaded flight of the conveyer in event of breakage from moving backward under the influence of its load and injuring the apparatus.

Furthermore, the invention has for its object to provide a barge divided into separate compartments or bins and provided at the opposite sides thereof with upwardly-swinging dumping-gates and at the bottoms of the same with sliding doors or cut-offs and to enable the sliding doors or cut-offs, the dumping-gates, and agitators to be successively operated, whereby the contents of the barge will be gradually delivered to the buckets of the conveyer to reduce the strain on the latter to a minimum.

Another object of the invention is to prevent the buckets from being overloaded, so that there will be no liability of the coal or other material spilling out of the buckets while the latter are traveling from the bins or compartments of the barge to the chutes.

It is also the object of the invention to enable hydraulic rams to be employed for lifting the dumping-gates and to enable such rams to be located at opposite sides of the gates and to have their power automatically equalized, so that the dumping-gates will be raised uniformly and prevented from sagging or twisting under the weight of the coal or other material irrespective of the uneven distribution of the same on the dumping-gates.

The invention consists in the construction and novel combination and arrangement of parts hereinafter fully described, illustrated in the accompanying drawings, and pointed out in the claims hereto appended.

In the drawings, Figure 1 is a diagrammatic longitudinal sectional view of the barge, illustrating the general arrangement of the parts. Fig. 2 is a vertical longitudinal sectional view of the bow of the barge. Fig. 3 is a similar view of the stern of the barge. Fig. 4 is an enlarged sectional view illustrating the arrangement of the drive-wheel for actuating the conveyer. Fig. 5 is a transverse sectional view of the barge looking forward. Fig. 6 is a transverse sectional view of the stern of the barge looking forward. Fig. 7 is an enlarged transverse sectional view of the lower portion of one of the bins or compartments of the barge, illustrating the arrangement of the conveyer, the trimmer, the sliding door or cut-off, and the agitator. Fig. 8 is an enlarged detail plan view illustrating the construction of the lower portion of the bins or compartments. Fig. 9 is an enlarged vertical sectional view on the line 9 9 of Fig. 8. Fig. 10 is a similar view on the line 10 10 of Fig. 8. Fig. 11 is an enlarged sectional view illustrating the construction for operating the sliding doors or cut-offs of the bins or compartments. Fig. 12 is a transverse sectional view illustrating the construction for actuating the rock-shaft for sliding the doors or cut-offs. Figs. 13 and 14 are sectional views illustrat-

ing the construction of the steam-cylinder for actuating the rock-shaft which is connected with the sliding doors or cut-offs. Fig. 15 is a diagrammatic view illustrating the arrangement of the hydraulic rams for raising the dumping-gates of the barge. Fig. 16 is a transverse sectional view illustrating the arrangement of the hydraulic rams. Fig. 17 is a vertical sectional view on the line 17 17 of Fig. 16. Fig. 18 is a plan view of one of the dumping-gates. Fig. 19 is a detail sectional view of the same on the line 19 19 of Fig. 18. Figs. 20, 21, and 22 are detail views illustrating the construction of the equalizing or compensating valve for controlling the hydraulic rams. Fig. 23 is an enlarged detail view of one of the chutes. Fig. 24 is an enlarged detail view illustrating the arrangement of the chutes and the booms. Figs. 25 and 26 are detail views of the boom. Fig. 27 is a vertical sectional view of the upper portion of the conveyer and the chutes, illustrating the manner of dumping the buckets. Figs. 28 and 29 are detail views illustrating the arrangement of the dumping-cams. Figs. 30 and 31 are detail views of the buckets. Fig. 32 is an enlarged detail view of one of the dumping-cams. Fig. 33 is a detail view of one of the lock-bars for holding the dumping-cams against lateral movement. Fig. 34 is an enlarged detail sectional view illustrating the manner of dumping the buckets. Fig. 35 is a detail view of the rear portion of the upper flight of the endless conveyer, illustrating the arrangement of the reversing-cam. Fig. 36, is an enlarged sectional view of the same. Fig. 37 is a detail view illustrating the arrangement of the safety-stop. Fig. 38 is a plan view of the same. Fig. 39 is an elevation of the winch, illustrating the arrangement of the series of drums. Fig. 40 is a sectional view illustrating the construction for controlling the tension device. Figs. 41 and 42 are detail views illustrating the construction of the safety pawl and ratchet.

Like numerals of reference designate corresponding parts in all the figures of the drawings.

1 designates a barge provided with a longitudinal series of bins or compartments 2, separated from one another at the bottom by partial transverse bulkheads or partitions 3, and each bin or compartment is provided at its bottom with a series of depending hoppers 4, having sliding doors or cut-offs 5, adapted to be opened to permit the coal to be discharged from the bins or compartments into buckets 6 of an endless conveyer 6*. The endless conveyer has one of its flights arranged beneath the longitudinal series of bins or compartments, and the cut-offs or doors of the compartments are adapted to be successively opened by the means hereinafter described, so that the cut-offs or doors of only one compartment or bin will be open at one time, whereby the strain on the conveyer incident to filling the buckets thereof with coal or other material will be reduced to a minimum. The bins or compartments, which terminate short of the ends of the barge, are spaced sufficiently from the bottom of the same to provide the necessary room for the bottom horizontal flight of the conveyer, and the said bins or compartments may be supported by any suitable structure. The barge is provided with a suitable hood 7, extending over the bins or compartments, and the latter have curved side walls 8, extending upward from the outer edges of upwardly-swinging dumping-gates 9, which are hinged at their inner edges 10 at opposite sides of the series of depending hoppers 4 of each bin or compartment, and the said gates 9 are adapted to be swung upward by the means hereinafter described to the position illustrated at the left-hand side of Fig. 5 of the accompanying drawings to arrange them in the same plane as the inclined sides of the depending hoppers 4, whereby the entire contents of the bins are directed into the hoppers. The upper portions or edges of the curved side walls 8 are connected with the deck of the barge by short inclined and vertical walls 11 and 12, the inclined walls 11 being located in the same inclined planes as the inclined sides of the hoppers 4 and the upwardly-swinging doors or gates 9 being adapted to extend across the space between the walls 11 and the inclined sides of the hoppers.

The sliding door 5 is mounted in suitable ways, preferably consisting of opposite horizontal bars 13, provided at intervals with bosses or enlargements 14, rounded at their upper edges, as clearly illustrated in Fig. 7 of the accompanying drawings, to reduce the friction to a minimum and to prevent the material from accumulating on them. Each door is provided at one side with a pair of depending ears arranged at opposite sides of the inner end of a link 15 and pivoted to the same, and the said link 15 extends outward to an arm 16, loosely mounted on a longitudinal rock-shaft 17 and adapted to be coupled thereto and uncoupled therefrom by the means hereinafter described, whereby the sliding doors or cut-offs are adapted to be operated independently of one another, so that one or more may be operated when the rock-shaft is partially rotated.

The sides of the depending tapering portions or hoppers 4 incline downward and inward from the inner hinged edges of the upwardly-swinging dumping-gates, and the end walls of the hoppers 4 incline downward from the lower edges of the transverse bulkheads and from suitable supports located between the bulkheads. Each bin or compartment is preferably provided with three depending hoppers; but the number may be varied, as will be readily apparent. The outer end walls of the end hoppers of the series are located at the bulkheads, and the adjacent upper edges of the inner inclined end walls of the series are suitably secured to the inter-

mediate supports 18, which may consist of angle-iron beams or channel-iron beams or any other form of support.

The walls at one side of the hoppers are provided with slots 19 to permit the passage of arms 20 of agitators 21, and the inner ends of the sliding doors or cut-offs are provided with corresponding slots, which register with the slots 19 and which form openings for the agitators. The agitators are adapted to be rotated by the means hereinafter described to cause the coal or other material to flow downward and to prevent a mass of coal from lodging or arching within the bins or compartments. The material is directed into the buckets of the conveyer, as illustrated in Fig. 7, by oppositely-inclined plates 23 and 24, terminating directly above the buckets and forming supports for longitudinal bars 25. The plate 23 at one side of the barge is provided with a slot or opening 26 to afford a passageway for the link 15, and the plate 24 at the opposite side of the barge is provided with slots or openings 27 to permit the passage of the arms of the agitators. The plate 24 has a guard 28 secured to its lower face and adapted to direct into the buckets any material escaping through the slots or openings of the plate 24.

Each of the arms 16 of the rock-shaft 17 is provided with a clutch-face 29, adapted to interlock with a corresponding clutch-face of a sliding clutch-section 30, whereby the arm of the rock-shaft is coupled to the clutch-section 30. The rock-shaft 17, which is located at one side of the barge, extends longitudinally thereof, and the clutch-sections 30, which are keyed or otherwise secured to the rock-shaft, are adapted to slide thereon to interlock with the arms 16 and to release the latter. Each clutch-section 30 is provided with an annular groove, which is engaged by lugs or projections 31 of the sides of a yoke 32, which is pivoted to an inner arm of a transversely-disposed rock-shaft 33. Each rock-shaft 33 is arranged at an inclination and is journaled in suitable bearings, its inner arm 34 being located above the rock-shaft 17, and the arm 35 at the outer end of the transverse rock-shaft is connected with the lower end of an operating-rod 36. The operating-rod, which extends to the deck and which is adapted to permit the couplings or clutches to be controlled from that point, is composed of yieldingly-connected upper and lower sections 37 and 38, having overlapped adjacent ends. The overlapped inner ends of the upper and lower sections of the operating-rod are slidingly connected and are engaged by coiled springs 39, which are adapted to permit a limited independent movement of the sections. The upper section 37 is provided with a swiveled handle or grip 40, having a shank 41, arranged in a suitable opening or slot at the deck and provided with a lug or flange 42, adapted to be arranged transversely of the slot when the operating-rod is raised, whereby the latter is maintained in its elevated position. The swiveled handle or grip is adapted to be turned when the operating-rod is elevated to permit the lug to lie transversely of the slot or opening. When the lifting-rod is drawn upward, the transverse rock-shaft is partially rotated and the inner arm thereof is swung in the direction of the adjacent arm 16 and the clutch-section is coupled with the hub of the arm. The clutch-section 30 is provided with lugs or projections to engage corresponding recesses of the clutch-face of the hub of the arm 16, and if the recesses of the hub of the arm should be out of alinement with the lugs or projections of the clutch-section the coiled springs 39 will permit the upper section of the operating-rod to be raised sufficiently to lock it, and it will cause the clutch-section 30 to spring into engagement with the clutch-face of the arm 16, when the longitudinal rock-shaft is rotated and the said recesses brought in alinement with the lugs or projections.

The arm 16 inclines upward and inward toward the sliding door or cut-off when the latter is closed, and it is inclined in the opposite direction when the door is open, as illustrated in Fig. 12 of the accompanying drawings. The rear end of the longitudinal rock-shaft 17 is provided with an arm 43, extending downward and outward, as clearly shown in Fig. 12, when the door is open and connected with a vertically-movable piston 44 of a vertical steam-cylinder 45 by vertical links 46. When the piston-rod is moved downward, the longitudinal rock-shaft is rotated to swing the arm 16 outward, and those arms 16 which are coupled to the longitudinal rock-shaft will be oscillated and the sliding doors or cut-offs with which they are connected will be opened.

The vertically-movable piston-rod 44 is provided with a piston-head 47, arranged within the cylinder 45, which is provided at one side with a steam-chest 48, disposed vertically and having a vertically-reciprocating tubular slide-valve 49 within it. The ends of the vertically-disposed cylinder 45 are connected with the ends of the steam-chest by upper and lower ports 50 and 51, and the vertically-movable slide-valve is provided with a reduced central portion located between enlarged ends of the slide-valve and providing an annular recess adapted when the slide-valve is at the limit of its movement in either direction to establish a communication between the steam-chest and one end of the cylinder to admit steam to one side or the other of the piston-head. The slide-valve is provided with upper and lower apertures 52 and 53, adapted to alternately register with the said ports to establish a communication between the interior of the cylinder and the interior of the slide-valve to permit the steam to exhaust from the former. The said slide-valve is provided between the upper and lower apertures and the terminals of the central re-

duced portion with solid imperforate portions, which are adapted, as illustrated in Fig. 13 of the accompanying drawings, to cover the ports and shut off the steam from both ends of the cylinder. The piston-rod at the end of each stroke is adapted to operate the slide-valve to carry it into the position shown in Fig. 13 of the drawings, so that the operator after actuating the operating mechanism, hereinafter described, may leave the steam-cylinder unattended.

The upper end of the slide-valve is connected with a vertically-movable rod 54, mounted in suitable guides and connected by a lever 55 with the piston-rod and with the operating mechanism. The upper end of the piston-rod is provided with a horizontal guide 56, receiving a pivot or other suitable device of the adjacent end of the lever, which has its other end connected by a rod 57 with one arm of a bell-crank lever 58. The rod 57 is disposed vertically, and the other arm of the bell-crank lever 58 is connected by a horizontal rod 59 with an operating-lever 60, mounted on the exterior of the hood at one side thereof and arranged within convenient reach from the deck and adapted to be swung upward and downward to reciprocate the slide-valve. When the slide-valve is moved in either direction by the operating mechanism, its position is changed, and steam is admitted to the opposite side of the piston-head, between the same and the adjacent end of the cylinder, and the piston is caused to reciprocate. The reciprocation of the piston oscillates the lever, which is connected with the slide-valve by the rod 54, and this oscillation of the lever 55 carries the slide-valve to the intermediate position illustrated in Fig. 13 of the drawings.

Each pair of agitators is mounted on a short longitudinal shaft 61, journaled in suitable bearings at one side of the adjacent hopper 4 and extending through the space between the adjacent inclined side of the hopper and the inclined plate 24 and connected by sprocket-gearing with a long longitudinal shaft 62. A large sprocket-wheel 63 is mounted on the short shaft 61 near one end thereof, and a sprocket-chain 64 extends from the sprocket-wheel 63 to a sprocket-pinion 65, loosely mounted on the longitudinal shaft 62, which is located at the side of the hoppers 4 opposite to that on which the longitudinal shaft 17 is located. The sprocket-chain is disposed transversely of the barge at one side of the hoppers, and the sprocket-pinion is provided with a clutch-face 66, adapted to be engaged by a corresponding clutch-face of a sliding clutch-section 67, whereby the sprocket-pinion is coupled to the longitudinal shaft and is caused to rotate therewith to actuate the agitators. The sliding clutch-section 67, which is slidingly connected with the shaft by any suitable means, is provided with an annular groove, which is engaged by projections or lugs of a yoke 68 of a depending arm 69 of a transverse rock-shaft 70, extending from the longitudinal shaft 62 to the opposite side of the bins and provided with an approximately horizontal arm 71, which is adapted to be oscillated similar to the arm 35 of the inclined transversely-disposed rock-shaft 33. The arm 71 of the transverse rock-shaft 70 is connected with an operating-rod 72, composed of upper and lower yieldingly-connected sections and provided at its upper end with a swiveled grip 73, adapted to be locked in an elevated position similar to the grips or handles of the operating-rods 36 for controlling the clutches of the sliding doors or cut-offs. The upper and lower sections of the operating-rod of the agitators are connected at their inner or adjacent ends, similar to the sections of the operating-rod 36, and the coiled springs which form the yielding connection are adapted to cause the sliding clutch-section to engage the clutch-face of the sprocket-pinion as soon as the longitudinal shaft 62 rotates should such clutch-faces be in a position to prevent such engagement when the operating-rod 72 is drawn upward to connect the corresponding agitators with the longitudinal shaft. The operating-rods 72 of the agitators are located at the same side of the deck as the operating-rods 35 of the sliding doors, so that they will be within convenient reach of the operator and will enable him to readily open the desired sliding doors and start the corresponding agitators.

The upwardly-swinging dumping-gates are provided at their sides and outer edges with antifriction-wheels 74, arranged to bear against the walls of the bins or compartments and adapted to enable the dumping-gates to swing upward with a minimum amount of friction. In order to prevent the coal or other material from becoming wedged between the edges of the dumping-gate and the walls of the bin or compartment and escaping or interfering with the upward-swinging movement of the said gates, the latter are provided at their sides and outer edges with plates or strips 76, secured to the upper faces of the dumping-gates and provided with flanges 77, extending outward and upward and frictionally engaging the walls of the bin or compartment. These marginal flanges of the dumping-gates are split at intervals to provide a continuous series of resilient tongues, which constitute the flanges 77 and which enable the necessary resiliency to be readily obtained without materially impairing the strength of the flanges.

The upward movement of the oppositely-disposed dumping-gates is effected by means of hydraulic rams 78, arranged in pairs and located at opposite sides of the dumping-gates, as clearly illustrated in the diagrammatic view in Fig. 15 of the accompanying drawings. These hydraulic rams, which may be of any desired construction and the specific construction of which constitutes no part of the present invention, are provided at

opposite sides with trunnions and are adapted to rock or oscillate as their plungers 79 move upward and downward in raising and lowering the dumping-gates. The trunnions of the rams are arranged in suitable bearings 80, and the inner trunnions are hollow and are connected with pipes 81 for supplying the water under pressure to the rams. When the water is admitted to the hydraulic rams, the plungers thereof move upward and carry with them the dumping-gate with which they are connected, and the admission of water to these rams is controlled by the means hereinafter described to equalize the power and to proportion the same to the load to be raised by the respective rams to cause the dumping-gates to be uniformly raised even when the coal is unevenly distributed over them, so that the said gates will not sag at either side and will not be twisted or strained by the action of the hydraulic rams. The adjacent ends of the pipes 81 are connected with the opposite sides of a valve-casing 82, having a longitudinal chamber 83, and provided with ports 84, extending therefrom to the pipes 81, which lead to the hydraulic rams. The valve-casing, which is disposed transversely of the barge, is provided at its top with an inlet-port 85, and it has an outlet or exhaust port 86 at its bottom, and it contains a reciprocating valve 87 and an oscillating valve 88, adapted to reciprocate with the valve 87 to be carried to and from the ports 84, which lead to the ram, and capable of oscillating over such ports to cause an even or uniform flow of water through the same to supply each of the rams with the same pressure and adapted to vary the flow of water through the said ports 84 to cause one of the rams to operate with greater power than the other when the load to be lifted is unevenly distributed over the surface of the dumping-gate. The valves 87 and 88 are connected with sections 89 and 90 of a valve-stem which is adapted to reciprocate to move the valve 87 longitudinally, and this valve 87 is provided with a recess 91 and has a solid portion 92. The recess 91 is adapted to establish a communication between the outlet or exhaust port 86 and the ports 84 to permit the water to exhaust from the hydraulic rams after the latter have been operated to raise the dumping-gates and it is desired to lower the gate. The solid portion 92 of the reciprocating slide-valve 87 is adapted to cover the outlet or exhaust port when the ports 84 are open, and it is also adapted to cover the ports 84 to cut off the water from the rams. The upper inlet-port 85 is connected by a suitable feed-pipe 93 with the tank 94, and the exhaust port or outlet is connected with an exhaust-pipe 95, which is adapted to return the water to the tank. The water is forced through the feed-pipe under pressure by any suitable means, and as such mechanism does not form a part of the present invention illustration thereof is deemed unnecessary.

The section 89 of the valve-stem is connected by links with an arm 96 of a rock-shaft 97, disposed approximately vertically and extending to the deck of the boat and provided at its upper end with a suitable arm or handle 98, by means of which the rock-shaft 97 is partially rotated to reciprocate the valve-stem in either direction.

The valve-stem section 90 is provided with a threaded socket for the reception of a threaded shank 99 of the section 89 of the stem, and the said section 90 is adapted to be oscillated by the means hereinafter described to oscillate the valve 88 over the ports 84 to vary the size of the openings thereof. The inner adjacent ends of the sections of the valve-stems are preferably reduced to fit in recesses of the valves 87 and 88, and coiled springs 100 and 101 are interposed between the sections of the valve-stem and the said valves at the bottoms of the recesses to hold the valves tightly against the walls of the chamber of the valve-casing.

The outer end of the section 90 of the valve-stem is provided with a laterally-extending head 102, forming a pair of oppositely-disposed arms and connected to the inner ends 103 of cables 104, which have their outer ends attached to the adjacent dumping-gate at the side edges thereof. The outer ends of the cables or other flexible connections pass around guide-pulleys 105, which are connected with suitable brackets at the lower edges of the partial transverse bulkheads which separate the bins or compartments, and the said cables extend from the outer guide-pulleys 105 to central guide-pulleys 106. The cables are looped by means of the central pulleys 106 and a pair of pulleys 107, located at opposite sides of and arranged slightly below the central pulleys 106. The loops which depend from the guide-pulleys 106 and 107 receive pulleys 108 of a weight 109. The cables after forming the loops extend downward from the pulleys 107 to the laterally-extending arms formed by the head 102. The inner portions of the cables cross each other and extend to the opposite sides of the valve in order to connect the cable at the right-hand side of Fig. 17 of the accompanying drawings with the right-hand arm of the valve-stem, and the cable at the left-hand side is connected with the other arm. Should the right-hand side prove lighter than the left-hand side of the dumping-gate, the right-hand arm will be lifted and the oscillatory valve will be swung toward the right to partially close the right-hand feed-port and lessen the power of the right-hand ram. This movement will correspondingly increase the size of the entrance of the feed-port at the left-hand side of the compensating valve, and the left-hand hydraulic ram will have its power correspondingly increased. The power will be proportioned between the rams to the loads to be lifted by them, so that they will operate with equal facility on an unevenly-distributed load. The weight keeps the ca-

OSE IN CENTER

bles taut; but only a slight movement of the oscillatory valve is necessary to effect this result and only a slight upward movement of the lighter side of the dumping-gate will occur before the compensating action is effected.

The barge is provided at its front portion with a tower 111, composed of front and rear sides 112 and 113, spaced apart and connected by a horizontal top portion 114, which is preferably housed in to protect the dumping mechanism and the scales, hereinafter described, from the weather. The front side or leg 112 of the tower is located at the bow of the barge and the rear side or leg is located at a point slightly in advance of the center of the same, ample space being provided between the sides or legs of the tower to enable a pair of extensible telescoping chutes 115 and 116 to swing from one side of the barge to the other. The endless conveyer 6ª is composed of a horizontal flight located at the bottom of the barge beneath the bins or compartments, an ascending upright flight located at the front side or leg of the tower, a descending upright flight supported by the rear leg or side of the tower, a top horizontal flight extending across the top of the tower, and an intermediate horizontal flight extending from the descending upright flight rearward over the rear portion of the barge to the rear end of the bottom horizontal flight, which travels beneath the bins or compartments.

The endless conveyer is provided at intervals with transverse shafts 117, which are connected by inner and outer links 118 and 119, arranged in pairs at opposite sides of the conveyer and located at the inner and outer sides of tracks hereinafter described. The shafts 117, which support the buckets 6, are provided at their ends with suitable spindles or journals for the reception of wheels 120, provided at their inner faces with peripheral flanges and arranged to run on suitable rails. The wheels of the bottom horizontal flight of the endless conveyer travel between upper and lower longitudinal rails 121 and 122, arranged in pairs at opposite sides of the conveyer, as clearly illustrated in Fig. 7 of the accompanying drawings. These rails 121 and 122 may be of any desired construction, and the upper rails 121 are inverted to bring their treads at the tops of the wheels of the endless conveyer. The other flights of the endless conveyer have their wheels arranged between and supported by inner and outer rails 123 and 124, extending upward at the front side or leg of the tower and across the top of the same and then downward and rearward to the stern of the boat. These rails 123 and 124 are supported by the tower and by a suitable structure 125, located above and extending longitudinally of the rear portion of the barge, as clearly indicated in Fig. 1 of the accompanying drawings.

The buckets 6, which are pivotally suspended from the conveyer when loaded, are provided at opposite sides with suitable journals or trunnions 126, arranged in suitable bearing-openings of the inner links of the endless conveyer, as clearly indicated in Fig. 7 of the drawings. The buckets are provided at their ends with curved lips 127 and 128, arranged, respectively, at the front and back of the buckets and below and above the transverse shafts of the conveyer when the buckets are arranged at the bottom of the barge and are receiving or have received a charge of coal or other material. The buckets when arranged at the bottom of the barge, with their curved lips in contact with the transverse shafts of the conveyer, are slightly tilted, and they are firmly supported in practically an upright position by the said transverse shafts; but as soon as the buckets begin to ascend at the front of the barge they will be caused to assume an upright position by their weight and will remain in such position until they are dumped to discharge their contents by the means hereinafter described. The front ends of the rails are spaced apart to receive guide-wheels 129 and are preferably diverged, as indicated in Fig. 1 of the accompanying drawings, to enable the wheels of the conveyer to readily enter and leave the spaces between the rails, and the rear ends of the rails may be slightly diverged, as shown in Fig. 1.

The endless conveyer is driven by a pair of wheels 130 of the sprocket type, provided at intervals at their peripheries with antifriction-wheels 131, adapted to engage the wheels at opposite sides of the endless conveyer, as clearly indicated in Fig. 4 of the accompanying drawings, whereby the friction is reduced to a minimum. The sprocket-wheels 130 are fixed by any suitable means to a lower horizontal shaft 132, disposed transversely of the barge at the back thereof and journaled in suitable bearings and connected by a train of gears with a main horizontal shaft 133. The main horizontal shaft, which is arranged parallel with the shaft 132, is connected by the means hereinafter described with an engine 134 and is provided with a pinion 135, which meshes with a large gear-wheel 136 of a counter-shaft 137, located midway between the shafts 132 and 133. The gear-wheel 136 is located at one end of the intermediate or counter shaft 137, which is provided at its other end with a pinion 138, meshing with a gear-wheel 139 of the shaft 132. This construction forms a train of gears for connecting the main shaft 133 with the shaft which drives the endless conveyer.

The main shaft 133 is provided with a sprocket-pinion 140, which is connected by a sprocket-chain 141 with a lower sprocket-pinion 142, having spur-teeth at one side to mesh with a bevel-gear 143 of the longitudinal agitator-driving shaft 62, whereby motion is communicated from the main shaft 133 to the agitators.

The steam for operating the engine and for

driving the piston of the vertically-disposed steam-cylinder 45 is received from a boiler 144, having suitable pipe connections with the steam-chest of the engine and the cylinder 45. These pipe connections may be of any desired construction and arrangement, and as their specific construction does not form a part of the present invention further description thereof is deemed unnecessary.

The guide-wheels 129 are mounted on a horizontal shaft 145, having its ends arranged in bearings of sliding journal-boxes 146, mounted in longitudinal ways 147 and connected with the ends of threaded rods 147*. The threaded rods, which have their front ends attached to the sliding journal-boxes, are engaged by rotary nuts 148 and extend through ears or lugs 149, arranged in pairs and preferably formed integral with the longitudinal guides. The guides, which may constitute a portion of a supporting-frame, may be provided with dovetailed or undercut edges to interlock with correspondingly-constructed edges of the sliding journal-boxes, and the said nuts are adapted to be rotated to move the rods longitudinally to slide the journal-boxes toward or from the ascending flight of the endless conveyer. By adjusting the guide-wheels the endless conveyer may be maintained at the desired tension. In order to enable the threaded rods to be moved simultaneously and accurately the same distance, the nuts 148 are provided with sprocket-teeth and are engaged by depending loops of a sprocket-chain 150, which extends across the space above the conveyer. The transverse portion of the endless sprocket chain 150 is composed of two flights arranged upon upper and lower sprocket-pinions 151, disposed in pairs and mounted in a suitable frame or hanger 152. The nuts are also provided with suitable openings or sockets adapted to be engaged by a rod or lever for rotating the nuts, and when either of the nuts is rotated by such a rod or lever motion will be communicated to the other through the sprocket-gearing and both nuts will be simultaneously rotated the same distance.

When the buckets 6 move forward at the bottom of the barge to receive their charge, the upper curved lips, which are located above the transverse shafts of the endless conveyer, are interposed between the said shafts and the pair of longitudinal bars 25, which are secured to the lower edges of the oppositely-inclined plates 23 and 24, and by these means the buckets are effectually prevented from tilting or swaying when the coal or other material drops into them. The excess of coal or other material falling into the buckets is scraped from them by means of a trimmer 153, located at the front side of each of the depending hoppers of the bins or compartments and consisting of a plate provided at its upper edge with a pintle 154, arranged in suitable bearings or eyes of a transverse plate or partition 155, disposed vertically and located at the front edges of the oppositely-inclined plates 23 and 24. The plates 23 and 24 coöperate with the trimmer and with the plate 155 to form a lower chute or spout for directing the material into the buckets. The trimmer is provided with laterally-extending arms 155*, consisting of a bar secured to and projecting from the sides of the trimmer, as clearly shown in Fig. 7 of the accompanying drawings. The outer ends of the arms 155* are connected by stout coiled springs 155* with the adjacent upper rails 121, and should a lump of coal be interposed between the bucket and the trimmer the bucket will be moved forward and will swing the trimmer forward until the springs are distended sufficiently to cause the trimmer to cut through the coal, whereby all excess of coal is effectually removed from the buckets. The excess of coal as it is scraped from one bucket is delivered into the next bucket, and the buckets are successively and uniformly filled without spilling any of the coal or other material. The trimmer tapers from top to bottom, and it extends downward between the longitudinal bars 25, which have their lower edges arranged sufficiently above the upper lips 128 of the buckets to clear the same when the said lips are supported by and in contact with the transverse shafts of the endless conveyer. The transverse plate 155, upon which the trimmer is mounted, tapers toward its bottom to provide inclined side edges to conform to the inclined side plates 23 and 24 and is provided with a rectangular opening to enable the trimmer-plate to engage the coal, or rather the excess of coal, carried by the buckets.

The loaded buckets ascend the front side of the tower in an upright position, as clearly illustrated in Fig. 27 of the accompanying drawings, being solely supported by their pivots or trunnions 126, and there is no liability of any of their contents spilling while they are traveling from the bottom of the barge to the top of the tower. In their passage across the top of the tower the buckets are dumped, as indicated in Fig. 27 of the drawings, to discharge their contents into hoppers 156 and 157 of scale-casings 158 and 159 by means of laterally-adjustable dumping-blocks 160 and 161. The dumping-blocks 160 and 161, which are located at opposite sides of the hoppers 156 and 157, are adapted to be engaged by and are located within the paths of cams 162 and 163, secured to the opposite sides of the buckets and arranged on the exterior thereof and having the pivots or trunnions of the buckets formed integral with their upper portions. The cams 162 and 163 are alternately arranged, so that every other bucket will engage the first dumping-blocks 160, while the other buckets will pass these dumping-blocks 160 and engage the other dumping-blocks 161, so that the contents of the buckets will be evenly distributed to the hoppers 156 and 157. The cams 162 and 163 have their sides and bottoms of the same contour,

and the cams 162 are provided with a projection or enlargement 164 to enable them to engage the first dumping-blocks 160, which are located out of the paths of the cams 163 of the other buckets. The cams 162 and 163 have tapered upper portions and are provided with sloping or oppositely-inclined lower edges, forming a rounded bottom.

The dumping-blocks 160 and 161 are slidingly mounted on transverse rods or bars 165 and are located directly over the hoppers of the scale-casings and are provided at their front ends with lower vertical edges and with upper inclined edges, and they have horizontal upper or top edges 166 extending from the inclined portions of the front edges to the upper terminals of long-inclined rear edges 167. When a bucket arrives at the front set of dumping-blocks, it is tilted by the same if its cams be provided with the enlargements or extensions 164, which project laterally from the opposite sides of the bucket. These extensions or enlargements 164 first engage the vertical front edges of the dumping-blocks, and as the bucket is carried forward through its pivotal connection with the inner links of the endless conveyer it is gradually tilted, and a continued forward or onward movement of the bucket draws the cams upward on the front edges of the dumping-blocks to the horizontal top edges, which are of sufficient length to hold the buckets in a substantially inverted position, as illustrated in Fig. 27 of the accompanying drawings, to enable their contents to be completely discharged into the hoppers of the scale-casings. After the cams leave the horizontal top edges of the dumping-blocks they are drawn down the inclined or sloping rear edges, which permit the buckets to gradually resume an upright position and prevent them from swinging against the transverse shafts of the conveyer with any force, whereby the buckets are prevented from being injured through contact with the dumping-blocks. The second set of dumping-blocks 161 is arranged in the paths of the cams 163, and they of course are engaged by all of the cams; but as every other bucket has had its contents discharged into the hopper of the first scale-casing only one-half of the coal or other material will be delivered to the hopper of the second scale-casing, although every bucket is dumped by the second set of dumping-blocks. The operation of dumping the material into the hopper of the second scale-casing is exactly the same as that heretofore described in connection with the hopper of the first scale-casing. The number of scale-casings and dumping-blocks may be varied by positioning the dumping-blocks and by providing cams for engaging the respective dumping-blocks. The dumping-blocks preferably consist of open frames, as clearly illustrated in Fig. 34 of the accompanying drawings, and they are provided at their bottoms with openings for the reception of the transverse rods or bars, which are preferably round, and annular enlargements or sleeves are preferably provided at the bottom openings of the dumping-blocks to increase the bearing-surface. The transverse rods or bars are provided at opposite sides with collars 168, arranged in pairs and located at opposite sides of the dumping-blocks and secured to the said rods or bars by means of clamping-screws or other suitable devices. The distance between the members of the pairs of collars is sufficient to receive the dumping-blocks and a detachable locking-bar 169, provided at its ends with hooks and adapted to rest upon and be supported by the transverse rods or bars 165. These locking-bars are adapted to be arranged at either side of the dumping-blocks to position the latter for engaging either of the cams 162 or 163. By arranging the locking-bars at the outer sides of the first set of dumping-blocks the latter will lie in the path of all of the cams, and each bucket will be dumped into the hopper of the first scale-casing. This may be desirable when it is only necessary to operate one of the chutes.

The scale-casings are designed to receive rotary scales, as indicated in Fig. 27 of the accompanying drawings; but as the particular construction of the scales does not form any part of the present invention such construction has not been illustrated. Each of the hoppers is provided with a pair of spouts 170 and 171, extending downward at an angle to each other and adapted to deliver the coal upon the scales in order that the coal or other material may be weighed as it is discharged into the vessel to be loaded. The passage of the material through the hopper is controlled by a hinged plate or cut-off 172, which is adapted, as illustrated in Fig. 27, to be arranged for closing either of the spouts 170 and 171, so that the coal may be weighed or not weighed, as desired. Should it be unnecessary or undesirable to weigh the material, the hinged plates or cut-offs will be arranged to close the spouts 170, and the material will then pass downward at the back of the scales without affecting the latter.

The scales and the scale-casings are mounted within the top of the tower, and the said scale-casings are provided with tapered lower portions forming spouts and communicating with depending annular sleeves or necks 173, arranged beneath the floor of the top of the tower and provided with suitable bearings for rotary sleeves or collars 174, to which the extensible telescopic chutes 115 and 116 are connected by suitable pivots 175. The adjustable chutes 115 and 116, which depend from the top of the tower at points between the front and rear sides or legs of the same, are adapted to rotate on the necks 173 to turn them in any direction and are capable of swinging on the horizontal pivots 175 to arrange the lower ends of the chutes at the desired elevation. The chutes 115 and 116, which are adapted to operate at either the

starboard or the port side of the barge, may be swung through the open space between the front and rear sides or legs of the tower, and they are controlled by suitable ropes or cables connected with a winch 176 and connected with booms 177 and 178, arranged in pairs at opposite sides of the top of the tower. The booms, which swing in horizontal planes, are supported in a horizontal position by guy ropes or cables 180 and 181 and are pivoted or hinged at their inner ends. The chutes, which have enlarged upper ends, are composed of upper, lower, and intermediate sections 182, 183, and 184, which are adapted to slide or telescope to vary the length of the chutes, and the telescoping or sliding movement of the sections is controlled by a rope or cable 185, secured at one end to the upper or top section of the chute and extending longitudinally of the latter to a pulley 186 of the lower or bottom section 183 and passing therefrom rearwardly along the chute to a pulley 187, mounted on the tower. The ropes or cables are then extended to the winch and are connected with suitable drums thereof. By winding the ropes or cables on the drums the chutes are shortened, and by unwinding the said cables the chutes are extended, and the weight of the sections of the chutes will cause the latter to extend themselves automatically as the cables or ropes are paid out.

The intermediate and lower sections of the chutes are connected with the booms by means of ropes or cables 189 and 190. The rope or cable 189 is connected at one end to the adjacent boom at a point intermediate of the ends thereof, and it extends downward to the intermediate section 184 and back to the boom, suitable blocks or pulleys being provided for the rope or cable. The other rope or cable 190 is arranged at the outer end of the boom and is connected in a similar manner with the lower or bottom section, and the ropes or cables are then extended over suitable pulleys to drums of the winch 176. The drums are mounted on a continuous shaft and are adapted to be coupled to the same by suitable clutches, whereby one or more may be simultaneously rotated. By winding the ropes or cables on the drums and by unwinding them therefrom the chutes may be readily controlled and may be arranged at any elevation or point between the barge and the booms, and the latter may be swung horizontally by any suitable means to extend the chutes in the desired direction. Each pair of booms is provided with the ropes or cables above explained, and the blocks or pulleys for connecting the ropes or cables 189 and 190 with the sections 183 and 184 of the chutes are designed to be detachable, preferably by means of hooks and eyes, so that the chutes may be coupled to the ropes or cables 189 and 190 of either pair of booms. When one set of ropes or cables 189 and 190 is in use, the other set is disconnected from the drums of the winch.

The horizontal shaft of the winch is connected by bevel-gearing with a short vertical shaft 191, which is similarly connected at its lower end with a horizontal shaft 192, and the latter extends from the short vertical shaft 191 to a long vertical shaft 193, which passes downward to the bottom of the barge. The lower end of the long vertical shaft 193 is connected by bevel-gearing with the longitudinal shaft with which the agitators are geared. Suitable shifting mechanism is provided for throwing the winch into and out of operation and for coupling the drums to the horizontal winch-shaft; but as this specific construction does not constitute a portion of the present invention detailed description and illustration thereof are deemed unnecessary.

After the buckets have been dumped and their contents discharged into the hoppers of the scale-casings they descend at the back of the tower and travel rearward toward the rear end of the barge, at which point they again enter the said barge and pass beneath the bins or compartments to receive another charge. At a point intermediate of the end of the intermediate horizontal flight of the endless conveyer the buckets are inverted and swung upward from a point beneath the links of the conveyer to a position above the same, as clearly illustrated in Fig. 36 of the accompanying drawings, by reversing cams 194 to position the buckets properly, so that they will reënter the barge at the back thereof and assume an upright position as soon as they arrive at the bottom of the barge. The reversing-cams 194, which are located at opposite sides of the conveyer, are approximately L-shaped, being composed of a vertical front portion, a horizontal rear portion, and a curved intermediate portion. They are supported by suitable brackets secured to the inner or lower rails 123, and they are arranged within the paths of the cams of the buckets and are engaged by the same, whereby as the buckets travel forward they will be successively swung upwardly and rearwardly to an inclined position by the reversing-cams 194. The movement of the buckets is completed by means of a central longitudinal guide-bar 195, located midway between the pairs of rails and provided with an inclined front portion 196, arranged to engage the lower portion of each bucket after the same has been brought to an inclined position by the reversing-cams, as clearly shown in Fig. 36 of the drawings. As each bucket is drawn over the inclined portion 196 of the guide-bar it is gradually brought to an inverted position above the links of the endless conveyer, and the longitudinal guide-bar 195 receives the lips of the buckets lying below the transverse shafts of the conveyer and maintains the said buckets in an inverted position until they descend to a point where the center of gravity will maintain them in their reversed position. The longitudinal guide-bar is curved to conform

to the configuration of the adjacent portion of the conveyer, and it terminates short of the vertical back portion of the same, as the center of gravity of the buckets lying beyond the pivots or trunnions will effectually prevent the buckets from accidentally swinging to the inner side of the endless conveyer.

In order to prevent the apparatus from being injured by the backward movement of the conveyer, caused by the loaded buckets of the ascending upright flight at the front of the tower in event of the breakage of the conveyer at any point, a safety-stop 197 is employed. This safety-stop, which is preferably arranged at the intermediate horizontal flight of the conveyer, consists of an approximately rectangular frame hinged at one end and normally supported in an elevated position above the adjacent portion of the endless conveyer and adapted to be immediately tripped by the backward movement of the conveyer, whereby the latter will be securely locked against backward movement to prevent the injury which would necessarily result should the weighted buckets of the upright flight at the front of the tower be permitted to fall and drive the endless conveyer backward. The rectangular frame is composed of two side bars connected between their ends by transverse rods and provided at one end of the frame with openings for the reception of a horizontal pintle 198. The other ends of the side bars are provided with recesses or seats 199, adapted to engage one of the transverse shafts of the endless conveyer or the pivots of one of the buckets. The safety-stop is normally supported by a pivoted or hinged hanger or support 200, located at one side of the rectangular frame of the stop and provided with a suitable shoulder 201, forming a seat for one end of the adjacent transverse rod 202. The support or hanger is tripped by means of a lever 203, pivoted between its ends to the lower portion of the support or hanger and having its upper end located adjacent to a stop 204, consisting of a projection or lug extending from the said support. The lower arm of the trip-lever is arranged in the path of both the transverse shafts and the pivots or trunnions at one side of the buckets, and as the endless conveyer moves forwardly in the direction of the arrow in Fig. 37 of the drawings the lower arm of the said trip-lever will be swung in the same direction, and its upper arm will thereby be carried away from the upper stop 204. Should, however, the conveyer break at any point, the weight of the loaded buckets of the front ascending flight will force the conveyer backward, and the adjacent transverse shaft or pivot will engage the trip-lever and move the same backward. As the backward movement of the trip-lever from the position illustrated in Fig. 37, independently of the support or hanger, is prevented by the stop 204, the support or hanger will be carried backward, and the safety-stop will be caused to fall by the withdrawal of the shoulder 201 from beneath the transverse rod 202. The recessed ends of the side bars of the safety-stop will then drop into the path of the transverse shafts and the pivots of the buckets and will engage the adjacent one. The safety-stop is supported when tripped in position to engage the said shafts by a pair of chains 205 or other flexible connections secured at their ends to the rod 202 and to a suitable support. By this construction the endless conveyer in event of breakage at any part of the same will be prevented from moving backward a greater distance than approximately the length of one of the buckets, and the safety-stop will be tripped before the endless conveyer has moved backward the distance of a half of a bucket. The safety-stop by engaging one of the transverse shafts of the endless conveyer is adapted to stop the backward movement of the same before the conveyer has gained any headway, and the strain incident to such stopping or checking of the backward movement of the conveyer is sustained by both the inner and outer links, and there is no liability of the conveyer receiving any injury from its engagement with the automatically-operating safety-stop.

In order to cushion and control the movement of the sliding doors of the barge, the vertically-movable piston 44 extends through an auxiliary cylinder 206 and is provided with a piston-head 207, arranged to reciprocate in the auxiliary cylinder, which is preferably located above the main or steam cylinder 45. The ends of the auxiliary cylinder are provided with upper and lower ports, which are connected by a passage 208, at the center of which is arranged a controlling-valve 209 for constricting the longitudinal passage 208 at this point. The auxiliary cylinder is filled with a suitable cushioning liquid, such as oil, and when the piston 44 is reciprocated its movement is resisted by the oil or other liquid within the auxiliary cylinder, which liquid is forced from the cylinder at one end through the longitudinal passage to the other end of the cylinder. By regulating the controlling-valve 209 the desired cushioning action may be obtained and the necessary resistance to the reciprocation of the vertically-movable piston is produced. A longitudinal tube or pipe connection may be employed for forming the longitudinal passage for connecting the upper and lower ports of the auxiliary cylinder, or any other desired construction may be used.

The movement of the sliding doors or cut-offs of the barge is limited by means of a sliding link 210 and a pin 211 of a bracket 212 in order that the said sliding doors or cut-offs may close properly and also in order that the clutch-faces of the loose arms 16 of the longitudinal shaft 17 may be approximately in position for engagement with the sliding clutch-sections. The link 210, which may be

connected with the adjacent edge of the sliding door or cut-off 5 in any suitable manner, is disposed horizontally and preferably consists of a rod or piece of metal doubled or bent at its center to form an approximately elongated U-shaped link, as clearly illustrated in Fig. 7 of the accompanying drawings. The pin 211, which is preferably headed, projects horizontally from the bracket 212 and extends through the opening of the link 210; but a projection for this purpose may be formed in any other suitable manner and may, if desired, be integral with the bracket 212. The bracket 212, which is provided with a depending arm for supporting the projection or pin, consists of a bar or piece of metal arranged as clearly shown in Fig. 7; but it may be constructed in any other suitable manner. The depending arm of the bracket is located at one end of the latter and the other end is preferably provided with a hook 213 for engaging the bottom flange of the adjacent channel-iron beam. The bracket is secured adjacent to its depending arm to a flange of a beam by means of a bolt 214 or other suitable fastening device; but the bracket may of course be changed to suit the parts to which it may be secured. The inward or closing movement of the sliding door or cut-off is limited by the bend or outer end of the link engaging the stop of the bracket 212, and the outward or opening movement of the sliding door or cut-off is limited by the depending arm of the bracket, which is arranged to be engaged by the said sliding door or cut-off. By this construction the weight of the arm 16, which is arranged at an inclination when the sliding door or cut-off is open and closed, will not operate to slide the said door or cut-off beyond the position to which it is carried by the mechanism for rocking the shaft 17, and the sliding door or cut-off may be allowed to remain in an open or a closed position.

The main horizontal shaft 133 is provided with a ratchet-wheel 215, adapted to be engaged by an automatically-operating pawl 216 to prevent retrograde rotation of the shaft 133 incident to any backward movement of the endless conveyer. The ratchet-wheel 215 is provided at opposite sides with annular enlargements 217, arranged to receive depending arms or sides of a yoke 218, located adjacent to the engaging end of the safety-pawl 216 and preferably formed integral therewith. The pawl 216, which is capable of a limited longitudinal movement, is normally supported out of engagement with the ratchet-wheel 215 by reason of the depending portions or sides of the yoke resting upon the annular enlargements at the top thereof. The rear end of the pawl 216 is provided with a longitudinal slot 219, receiving a suitable fastening device 220, which limits the movement of the pawl. The annular enlargements, which support the pawl 216, create sufficient friction to draw the pawls 216 forward in the position shown in full lines in Fig. 41 of the accompanying drawings. The engaging end of the pawl is supported above the ratchet-teeth of the ratchet-wheel when the pawl is in the position illustrated in full lines in Fig. 41 and while the ratchet-wheel is rotating in the direction of the arrow in the said figure; but should the direction of the rotation of the shaft 133 be reversed the friction exerted by the smooth annular portions of the ratchet-wheel will carry the pawl backward to the position illustrated in dotted lines in Fig. 41 of the drawings, whereby the said shaft 133 will be locked against further movement in that direction. The safety-pawl will assist the safety-stop in preventing the endless conveyer from moving backward under the influence of the weight of the ascending upright flight, and the depending support or yoke 218 renders the pawl 216 noiseless and prevents the constant click which would result were the pawl 216 permitted to rest normally upon the teeth of the ratchet-wheel.

In order to prevent any lateral movement of the endless conveyer at the break in the rails incident to the location of the drive and guide wheels at the stern and bow of the barge, front and rear guide-plates are provided. The rear guide-plates 221, which are located at opposite sides of the conveyer at the stern of the boat, are disposed approximately horizontally, as clearly indicated in Figs. 4 and 6 of the accompanying drawings. These plates extend from the rear end of the rail 124 to the adjacent end of the upper rail 121, and they are arranged to be engaged by the ends of the transverse shafts of the endless conveyer to prevent any lateral movement whereby the wheels of the endless conveyer will be maintained in proper position to be engaged by the wheels 131, mounted at the periphery of the drive-wheels 130. These rear guide-plates also operate to hold the wheels 120 of the endless conveyer in proper position for guiding them between the upper and lower longitudinal rails 121 and 122 at the bottom of the barge, so that the flanges of the said wheels 120 will be arranged at the inner sides of the rails.

The bow of the barge is provided with upper and lower guide-plates 222 and 223, arranged in pairs and located at opposite sides of the conveyer. The lower guide-plates 223, which are disposed at a slight inclination, as clearly illustrated in Fig. 2 of the accompanying drawings, extend from the front ends of the rails at the bottom of the barge to within a short distance of the outer rails 124, and the upper plates 222, which are located adjacent to the rails 123 and 124, are disposed approximately vertically, and their lower ends are arranged at a slight inclination to form a flaring entrance or space between them to prevent their lower ends from catching on the conveyer and also to enable the latter to pass readily between them. The lower plates

prevent any lateral movement of the endless conveyer on the guide-wheels, and the upper plates serve to guide the wheels of the endless conveyer between the inner and outer rails 123 and 124.

In order to prevent the drive-wheels 130 from lifting the wheels 120 of the endless conveyer when the latter arrive at the bottom of the drive-wheel and the wheels 131 of the latter begin to ascend after actuating the endless conveyer, a centrally-arranged guard 224 is provided. This guard consists of a curved bar 225, arranged centrally over the bottom horizontal flight of the endless conveyer at the rear end of the said flight and supported by an inclined brace 226. The curved guard is arranged to be engaged by the endless conveyer, and should there be any tendency of the drive-wheel to lift the conveyer-wheels the guard will cause the latter to drop out of engagement with the drive-wheels, and there will be no liability of the endless conveyer becoming interlocked with the drive-wheel and stopping the apparatus.

The operation of the invention is as follows: After the barge has been loaded, which operation may be accomplished by any suitable means, it is towed to the vessel to be supplied with coal or other material; but it will be readily apparent that the barge may be provided with means for propelling it, if desired. After the barge has been properly positioned and anchored with relation to the vessel to be loaded the superimposed chutes are adjusted by the means before described and are arranged for delivering the coal or other material into the hold of the vessel. The chutes are capable of being varied in length and swung horizontally and vertically at either side of the barge to arrange them in such position, and they may be changed from one portion of the vessel to another, as may be found necessary or desirable. When the chutes have been properly positioned, the cut-offs of the scale-casings are arranged to cause the material to operate the scales or to pass the latter without operating them. The conveyer is then set in motion, and one of the sliding doors is opened by coupling the corresponding oscillating arm 16 to the shaft 17 by pulling upward on the operating-rod 36, which is connected with the said clutch and which may be locked in such elevated position by means of its swiveled handle or grip. The valve of the vertically-disposed steam-cylinder is reciprocated to actuate the plunger of the said cylinder and rock the shaft 17. This opens the sliding door or cut-off, and the coal begins to discharge into the buckets of the endless conveyer. The agitator corresponding with the open sliding door or cut-off may be set in motion at this time by actuating its operating mechanism, which is located adjacent to the operating-rod 36. The said sliding door and cut-off and the agitator may be operated in a very short time, as the operating mechanism of the couplings and the steam-cylinder are arranged at the deck of the barge within easy reach. The buckets as they are filled are operated on by the trimmer, which removes all the superfluous material and which is actuated by coiled springs, and these coiled springs have their tension increased by the swinging of the trimmer, and sufficient force or power may be obtained in this manner to enable the trimmer to cut off the coal should a large lump interpose itself between the buckets and the said trimmer. By this construction the buckets will be uniformly filled and there will be no liability of the material accidentally spilling from the buckets while the latter are traveling from the barge to the chutes. The doors or cut-offs of each bin or compartment of the barge may be successively opened, and as the material within a bin or compartment becomes reduced the oppositely-disposed dumping-gates, which constitute portions of the bottom of the bin, are swung upward by the hydraulic rams, which are pivotally mounted and which have their plunger pivotally connected with the dumping-gates. The reciprocating valve of the hydraulic rams is connected with operating mechanism located at the same side of the barge as the operating mechanism for controlling the couplings of the agitator and sliding-door mechanisms. As the dumping-gates are swung upward the material on them is caused to slide downward to the depending hopper portions 4 of the bin. Should the material be unevenly distributed over the dumping-gates, the compensating valves, which are connected with the rams, will vary the power and enable the same to be proportioned properly to the load to be lifted by the respective rams. After one compartment has been emptied the dumping-gates are returned to their normal position, the sliding doors are closed, and the agitators are stopped. The other bins are successively operated in this manner until the entire load of the barge is transferred to the vessel being loaded or until the desired quantity has been supplied. The buckets laden with coal or other material ascend the tower at the front side or leg thereof, and those buckets which carry the projections or enlargements of the cams engage the first set of dumping-blocks and are inverted to discharge their contents into the scale-casing of the front chute. The front set of dumping-blocks are spaced farther apart than the rear ones, and those buckets which are not provided with the projections or enlargements of the cams pass between the front set of dumping-blocks and are not affected by the same; but when they arrive at the rear set of dumping-blocks they are tilted and caused to discharge their contents into the scale-casing of the rear chute. Each of the buckets is operated by the second set of dumping-blocks; but as every other bucket has been emptied before they arrive at the second set of dumping-blocks it will be ap-

COPY BOUND CLOS

parent that this will not affect the uniform distribution of the material to the front and rear chutes. The empty buckets descend at the rear side or leg of the tower, and they travel rearward to the stern of the barge, passing over the rear portion of the latter. As they arrive at the back of the conveyer they are automatically carried from a position beneath the intermediate rearwardly-extending flight of the conveyer to a point above the same by the reversing-cams, as illustrated in Fig. 35 of the drawings, and they are held in this position by the longitudinal guide-bar until the center of gravity of the buckets by reason of their movement downward and rearward is carried beyond the pivots, so that the buckets will be held at the outer side of the rear portion of the conveyer by gravity. The buckets when at the outer side of the rear portion of the conveyer are in proper position for entering the chute, and they will thereby lie below the bottom horizontal flight of the endless conveyer and be in proper position to receive another charge of material. As the loaded buckets ascend at the front of the tower the conveyer in event of a breakage at any point will be forced backward by the weight of the material in the buckets of the front ascending flight, and in order to prevent the conveyer from moving backward any distance under the influence of this weighted upright flight the safety-stop, which is clearly illustrated in Fig. 37, is provided. The tripping mechanism of the safety-stop is operated by the backward movement of the conveyer, and the safety-stop will immediately check this backward movement before this weighted front flight has had the slightest opportunity to effect any injury.

The apparatus requires only a very few hands to operate it, as the only parts requiring attention are the engine and the devices for controlling the sliding doors, the agitators, and the dumping-gates after the chutes have been properly positioned.

What I claim is—

1. In an apparatus for handling material in bulk, the combination of a barge, a superimposed chute capable of movement to arrange it in the desired position, an endless conveyer extending from the barge to the chute and having an upright flight for conveying the material from the barge to the chute, and an automatically-operating safety-stop arranged above one of the flights of the conveyer and being normally out of engagement with the same and capable of operation solely by the backward movement of the conveyer, whereby it will be dropped to its engaging position, substantially as described.

2. In an apparatus for handling material in bulk, the combination of a barge, a tower, a superimposed extensible chute suspended from the tower and having a hinge and swivel connection therewith, whereby it is capable of both vertical and horizontal oscillation and is adapted to swing both transversely and longitudinally of the barge to enable it to be arranged at either side thereof and to extend forward and aft, and a conveyer extending from the barge to the chute, substantially as described.

3. The combination of a barge, a tower, a pair of horizontally-swinging supporting-booms arranged at opposite sides of the tower, a superimposed chute capable of movement to arrange it in the desired position, means for connecting the chute with either of the booms, and a conveyer extending from the barge to the chute, substantially as described.

4. In an apparatus for handling material in bulk, the combination of a barge provided with a support or tower, a superimposed chute depending from the support or tower and arranged to swing vertically and horizontally, a boom hinged to the tower or support and located above the chute and arranged to swing horizontally, adjustable connections supporting the chute from the boom, and a conveyer extending from the barge to the chute, substantially as described.

5. In an apparatus for handling material in bulk, the combination of a barge having a tower, a superimposed chute suspended from the support or tower and arranged to swing transversely and longitudinally of the barge, whereby it is adapted to be arranged in any direction at either side of the said barge, the booms located at opposite sides of the tower or support and arranged to swing horizontally to enable it to move with the chute when the latter swings longitudinally of the barge, connections depending from the booms and detachably engaging the chute, whereby the latter may be supported from either boom to arrange it at either side of the barge, and a conveyer extending from the barge to the support or tower and passing over the chute, substantially as described.

6. In an apparatus for handling material in bulk, the combination of a barge having a support or tower, a pair of extensible chutes suspended from the support or tower and arranged to swing through the same transversely of the barge to either side of the latter and capable also of swinging longitudinally of the barge, a pair of booms hinged to the support or tower and arranged to swing horizontally to move with the chutes when the latter swing longitudinally of the barge, the adjustable connections between the booms and the chutes, and a conveyer extending from the barge to the chutes, substantially as described.

7. In an apparatus for handling material in bulk, the combination of a barge having a support or tower, the superimposed chutes suspended from the support or tower and arranged to swing through the same transversely of the barge and capable also of swinging longitudinally of the barge, the booms arranged in pairs at opposite sides of the barge and hinged to the support or tower and arranged to swing horizontally to enable them

SE IN CENTER

to move with the chutes when the latter swing longitudinally of the barge, means for adjustably and detachably connecting the chutes with the booms, whereby the chutes are adapted to be supported at either side of the barge, and a conveyer extending from the barge to the chutes, substantially as described.

8. In an apparatus for handling material in bulk, the combination of a barge, a tower, a pair of horizontally-swinging booms mounted on the tower and located at opposite sides of the barge, a vertically and horizontally swinging chute mounted on the tower and adapted to be swung forward and rearward and laterally to either side of the barge to arrange it beneath either boom, and means for connecting the chute to either of the booms, substantially as described.

9. The combination of a barge, a support or tower mounted on the barge and provided with an opening, a superimposed chute depending from the top of the support or tower at the said opening and arranged to swing through the same transversely of the barge to carry it to either side of the latter, and capable also of swinging longitudinally of the barge, means for supporting the chute in its adjusted position, and a conveyer extending from the barge to the support or tower and passing over the chute, substantially as described.

10. In an apparatus for handling material in bulk, the combination of a barge provided with bins or compartments and having cut-offs at the bottoms thereof, a superimposed chute, a conveyer extending from the barge to the chute and passing beneath the said bins or compartments, a shaft extending longitudinally of the barge, a series of arms loosely mounted on the shaft and connected with the cut-offs, couplings arranged at intervals for connecting the arms to the shaft, and means for operating the couplings independently of one another, whereby one or more of the cut-offs may be operated by the shaft, substantially as described.

11. In an apparatus for handling material in bulk, the combination of a barge having bins or compartments provided with cut-offs, a superimposed chute, a conveyer extending from the barge to the chute and having a flight located beneath the bins or compartments, a longitudinal shaft, independent connections between the cut-offs and the shaft, and means for operating such connections independently of one another, whereby one or more of the cut-offs may be operated, substantially as described.

12. In an apparatus for handling material in bulk, the combination of a barge provided with a series of cut-offs, a movable chute located above the barge, a conveyer extending from the barge to the chute and arranged adjacent to the cut-offs, a shaft, a series of arms loosely mounted on the shaft and connected with the cut-offs, couplings for locking the arms rigid with the shaft, means for operating the couplings independently of one another, and a steam-cylinder having a piston connected with and adapted to rock the shaft, substantially as described.

13. In an apparatus for handling material in bulk, the combination of a barge having a bin or compartment and provided with a series of movable cut-offs, a movable chute located above the barge, an endless conveyer extending from the barge to the chute and arranged to receive material from the cut-offs, a shaft, a series of arms loosely mounted on the shaft and connected with the cut-offs, couplings for locking the arms to the shaft, a steam-cylinder connected with and adapted to rock the shaft, and operating mechanism extending from the couplings and from the steam-cylinder to the deck of the barge, substantially as and for the purpose described.

14. In an apparatus for handling material in bulk, the combination of a barge provided with a longitudinal series of bins or compartments and having movable cut-offs, a movable chute located above the barge, a conveyer extending from the barge to the chute and arranged to receive material from the cut-offs, a longitudinal shaft arranged at one side of the conveyer, a series of arms loosely mounted on the longitudinal shaft and connected with the cut-offs, couplings for locking the arms to the longitudinal shaft, a series of agitators, the short longitudinal shafts carrying the agitators, the long longitudinal tongue-shaft connected by gearing with the short shafts, couplings for connecting the said gearing with the counter-shaft, and operating mechanism located at one side of the barge and extending to all of the said couplings and adapted to enable them to be independently operated, substantially as described.

15. In an apparatus for handling material in bulk, the combination of a barge having a bin or compartment and provided with a series of movable cut-offs, a movable chute located above the barge, an endless carrier extending from the barge to the chute, a longitudinal rock-shaft provided with a rigid arm and having a series of loosely-mounted arms connected with the cut-offs, couplings for locking the arms to the rock-shaft, a steam-cylinder having a piston connected with the rigid arm of the rock-shaft, and operating mechanism for controlling the couplings and the steam-cylinder whereby one or more of the cut-offs may be opened and closed, substantially as described.

16. In an apparatus for handling material in bulk, the combination of a barge having a bin or compartment and provided with dumping-gates, a superimposed chute, a conveyer extending from the barge to the chute, a series of hydraulic rams connected with the dumping-gates and capable of movement to conform to the movement of the said dumping-gates, and means for operating the rams

COPY BOUND

to raise and lower the dumping-gates independently of one another, substantially as described.

17. In an apparatus for handling material in bulk, the combination of a barge having a bin or compartment and provided with a series of dumping-gates, a superimposed chute, a conveyer extending from the barge to the chute, a series of pivotally-mounted hydraulic rams located beneath and connected with the dumping-gates and capable of movement to adjust themselves to the movement of the said dumping-gates, and means for operating the rams for raising and lowering the dumping-gates independently of one another, substantially as described.

18. In an apparatus for handling material in bulk, the combination of a barge having a bin and provided with a series of dumping-gates arranged to swing upward and downward, a superimposed chute, a conveyer extending from the barge to the chute, a series of movably-mounted hydraulic rams located beneath and pivotally connected with the dumping-gates, and means for operating the rams to open and close the dumping-gates independently of each other, substantially as described.

19. In an apparatus for handling material in bulk, the combination of a barge having a bin and provided with a dumping-gate, a movable chute located above the barge, a conveyer extending from the barge to the chute, a pair of hydraulic rams located beneath and connected with the dumping-gate at opposite sides thereof, and a compensating valve connected with the hydraulic rams and adapted to vary the power of the same to enable the dumping-gate to be uniformly raised, substantially as and for the purpose described.

20. In an apparatus for handling material in bulk, the combination of a barge provided with bins or compartments and having oppositely-disposed upwardly-swinging dumping-gates, the hydraulic rams arranged in pairs and located beneath and connected with the dumping-gates, and compensating valves connected with the hydraulic rams and with the dumping-gates and operated by the latter to vary the power to suit the load to be lifted, substantially as and for the purpose described.

21. In an apparatus for handling material in bulk, the combination of a barge having a bin or compartment and provided with a dumping-gate, a movable chute located above the barge, a conveyer extending from the barge to the chute, a pair of hydraulic rams connected with the dumping-gate at opposite sides thereof, a compensating valve connected with the hydraulic rams and adapted to vary the power of the same, and flexible connections between the valve and the opposite sides of the dumping-gate for controlling the action of the valve to proportion the power to the weight to be lifted by the rams, substantially as described.

22. In an apparatus for handling material in bulk, the combination of a barge having a bin or compartment and provided with a dumping-gate, a movable chute located above the barge, a conveyer extending from the barge to the chute, a pair of hydraulic rams connected with the dumping-gate at opposite sides thereof, a compensating valve for controlling the feed or supply of liquid to the rams to vary the power thereof, flexible connections extending from the compensating valve to the opposite sides of the dumping-gate, and a weight for holding the flexible connections taut, substantially as described.

23. In an apparatus for handling material in bulk, the combination of a barge having a bin or compartment and provided with a dumping-gate, hydraulic rams connected with the dumping-gate and arranged at opposite sides thereof, a movable chute located above the barge, a conveyer extending from the barge to the chute, a compensating valve connected with the rams for controlling the feed to the same to vary the power of the rams, flexible connections extending from the valve to the opposite sides of the dumping-gate and provided with similar loops, guide-pulleys receiving the flexible connections, and a weight supported by the said loops and having pulleys for the reception of the same, substantially as described.

24. In an apparatus for handling material in bulk, the combination of a barge having a bin or compartment and provided with a dumping-gate, a chute, a conveyer extending from the barge to the chute, a pair of hydraulic rams located beneath and connected with the dumping-gate at opposite sides thereof, an oscillatory compensating valve for controlling the feed to the hydraulic rams, the central guide-pulley 106, the guide-pulleys 105 located adjacent to the sides of the dumping-gate, the pulleys 107 located at opposite sides of the central pulley 106, the flexible connections secured at their outer ends to the dumping-gate near the side edges thereof and extending from the pulleys 105 to the central pulley 106 and provided with loops depending from the pulleys 106 and 107, said flexible connections being attached at their inner ends to the compensating valve, and a weight supported by the said loops, substantially as described.

25. In an apparatus for handling material in bulk, the combination of a barge having a bin or compartment provided with a dumping-gate arranged to swing upward and downward, hydraulic rams movably mounted beneath the dumping-gate and connected with the same and capable of yielding to the upward-and-downward swinging movement of the said dumping-gate, and means operated by the dumping-gate for varying the power of the rams, substantially as described.

26. In an apparatus for handling material in bulk, the combination of a barge having a bin or compartment provided with a hinged

CLOSE IN CENTER

788
414

dumping-gate arranged to swing upward and downward, hydraulic rams movably mounted beneath the dumping-gate and having plungers connected with and adapted to raise the said dumping-gate, said rams being adapted to adjust themselves to the swinging movement of the dumping-gate, and means for operating the rams, substantially as described.

27. In an apparatus for handling material in bulk, the combination of a barge having a bin provided with a hinged dumping-gate, a pair of movably-mounted hydraulic rams located beneath and connected with the dumping-gate and capable of yielding to the swinging movement thereof, and means for connecting the rams with the dumping-gate for automatically varying the power of the rams to adapt the same to the disposition of the material on the gate, substantially as described.

28. In an apparatus for handling material in bulk, the combination of a barge having a bin provided with a hinged dumping-gate, a pair of movably-mounted hydraulic rams located at opposite sides of the dumping-gate and capable of yielding to the swinging movement of the latter, and a compensating valve connected with and adapted to vary the power of the rams, substantially as described.

29. In an apparatus for handling material in bulk, the combination of a barge having a bin or compartment and provided with a dumping-gate, a pair of oppositely-disposed hydraulic rams connected with the dumping-gate and adapted to actuate the same, a compensating valve connected with the hydraulic rams and adapted to vary the power of the same, and means connected with the gate for controlling the valve, substantially as and for the purpose described.

30. In an apparatus for handling material in bulk, the combination of a barge provided with bins or compartments and having oppositely-disposed upwardly-swinging dumping-gates, a chute, an endless conveyer extending from the barge to the chute and having one of its flights located beneath the dumping-gates, the hydraulic rams arranged in pairs and located beneath and connected with the dumping-gates, and compensating valves connecting the members of each pair of hydraulic rams and also connected with the dumping-gates and adapted to vary the power of the rams to correspond with the disposition of the material on the gates, substantially as described.

31. In an apparatus for handling material in bulk, the combination of a barge having a bin or compartment provided with a dumping-gate, a pair of hydraulic rams connected with the dumping-gate at opposite sides thereof, a compensating valve connected with the hydraulic rams and adapted to vary the power of the same, and flexible connections between the valve and the opposite sides of the gate for controlling the valve for varying the power to arrange the same to correspond with the disposition of the load, substantially as described.

32. In an apparatus for handling material in bulk, the combination of a barge having a bin or compartment and provided with a dumping-gate, a pair of hydraulic rams connected with the dumping-gate, a compensating valve for controlling the feed or supply of liquid to the rams to vary the power thereof, flexible connections between the compensating valve and the gate, and a weight for holding the flexible connections taut, substantially as described.

33. In an apparatus for handling material in bulk, the combination of a barge having a bin or compartment and provided with a dumping-gate, hydraulic rams connected with the dumping-gate and arranged at opposite sides thereof, a compensating valve connected with and adapted to vary the power of the rams, flexible connections extending from the valve to the opposite sides of the dumping-gate and provided with similar depending loops, guides receiving the flexible connections, and a weight supported by the said loops, substantially as described.

34. In an apparatus for handling material in bulk, the combination of a barge having a bin or compartment and provided with a dumping-gate, a pair of hydraulic rams located beneath and connected with the dumping-gate at opposite sides thereof, an oscillatory compensating valve for varying the power of the rams, the central guide-pulley 106, the guide-pulleys 105 located adjacent to the side edges of the dumping-gate, the pulleys 107 arranged at opposite sides of the central pulley 106, the flexible connections secured at their outer ends to the dumping-gate, near the side edges thereof and extending from the pulleys 105 to the pulley 106 and provided with opposite depending loops extending downward from the pulleys 106 and 107, said flexible connections being connected at their inner ends with the compensating valve, and a weight supported by the loops, substantially as described.

35. In an apparatus for handling material in bulk, the combination of a barge having a bin or compartment and provided with a swinging dumping-gate, a pair of pivotally-mounted hydraulic rams having their pistons pivoted to the dumping-gate at opposite sides thereof and the oscillatory compensating valve connected with the opposite sides of the dumping-gate and adapted to vary the power of the rams, substantially as and for the purpose described.

36. In an apparatus for handling material in bulk, the combination of a barge having a bin or compartment and provided with a swinging dumping-gate, a pair of pivotally-mounted hydraulic rams having their pistons pivoted to the dumping-gate at opposite sides thereof, the oscillatory compensating valve adapted to vary the power of the rams and provided with an exterior head, and connections between the head and the dumping-gate, whereby the power is varied to correspond

with the disposition of the load, substantially as described.

37. In an apparatus for handling material in bulk, the combination of a barge, a tower, a superimposed chute suspended from the tower and capable of movement to arrange it in the desired position, horizontally-swinging supporting-booms arranged at opposite sides of the tower, adjustable connections depending from the booms and provided with means for detachably suspending the chute from the booms, whereby the chute may be arranged beneath and connected with either boom, and a conveyer extending from the barge to the chute, substantially as described.

38. In an apparatus for handling material in bulk, the combination of a barge, a tower, a chute depending from the tower and capable of movement to arrange it in the desired position, horizontally-swinging booms arranged at opposite sides of the tower, flexible connections depending from the booms and adapted to be connected with the chute to support the same at either side of the barge, and a winch having drums adapted to receive the flexible connections at either side of the tower, substantially as described.

39. In an apparatus for handling material in bulk, the combination of a barge, a tower arranged at the front of the barge and having an opening, an endless conveyer provided with buckets and consisting of a bottom horizontal flight located within the barge, the ascending and descending upright flights mounted on the tower, and the rearwardly-extending intermediate flight connecting the descending upright flight with the rear end of the bottom horizontal flight, a chute depending from the tower and arranged to swing through the same and through the conveyer to carry it from one side of the barge to the other, dumping mechanism for inverting the buckets to discharge their contents into the chute, and reversing mechanism located at the rearwardly-extending intermediate flight of the conveyer and adapted to swing the buckets from beneath the intermediate rearwardly-extending flight to a point above the same, whereby the buckets are caused to enter the barge in proper position to receive another charge, substantially as described.

40. In an apparatus for handling material in bulk, the combination of a barge, a tower mounted on the barge, an endless conveyer provided with buckets and having ascending and descending flights located in advance and in rear of the tower, a chute located beneath the top of the conveyer and arranged to swing through the same and supported by the tower, dumping mechanism arranged at the top of the tower, a safety-stop located between the tower and the stern of the barge and normally held out of engagement with the conveyer, and means for reversing the buckets before the same reënter the barge, substantially as described.

41. In an apparatus for handling material in bulk, the combination of a barge, a tower arranged at the front of the barge and having an opening, an endless conveyer provided with buckets and consisting of a bottom flight located within the barge, the ascending and descending upright flights supported by the tower, and the rearwardly-extending intermediate flight connecting the descending flight with the rear end of the bottom flight, a chute supported by the tower and arranged to swing through the same and through the conveyer, dumping mechanism for inverting the buckets to discharge their contents into the chute, a reversing-cam arranged at the back of the endless conveyer and adapted to swing the buckets from their position beneath the intermediate flight to a point above the same, whereby the buckets are caused to enter the barge in proper position to receive another charge, substantially as described.

42. In an apparatus for handling material in bulk, the combination of a barge provided with a longitudinal series of bins or compartments, a tower arranged at the front of the barge and having an opening, an endless conveyer provided with buckets and consisting of a bottom flight located within the barge and extending beneath the bins or compartments, the upright ascending and descending flights supported by the tower, and the rearwardly-extending intermediate flight, a chute supported by the tower and arranged to swing through the tower and through the conveyer, dumping mechanism for discharging the contents of the buckets into the chute, drive-wheels located at the stern of the barge and engaging the endless conveyer, guide-wheels arranged at the bow of the barge, a longitudinal guide-bar located beneath the bins or compartments and arranged to engage the buckets, whereby the latter are rigidly maintained in a horizontal position to prevent them from being accidentally oscillated when the material is discharged into them, and means for rotating the drive-wheels, substantially as described.

43. In an apparatus for handling material in bulk, the combination of a barge having bins or compartments and provided at the bottoms thereof with independent cut-offs, a tower having an opening, an endless conveyer provided with pivoted buckets and consisting of a bottom flight arranged beneath the bins or compartments, the ascending and descending upright flights supported by the tower, and the rearwardly-extending intermediate flight, a chute arranged to swing through the tower and through the endless conveyer, dumping mechanism for discharging the contents of the buckets into the chute, a reversing-cam located at the back of the endless conveyer and adapted to swing the buckets from their position beneath the intermediate flight to a point above the same for causing the buckets to enter the barge in proper position to receive another charge, and means

for operating the cut-offs independently of one another and for locking them in their open position, substantially as and for the purpose described.

44. In an apparatus for handling material in bulk, the combination of a barge having bins or compartments provided with lower cut-offs and having oppositely-disposed dumping-gates, a tower, an endless conveyer provided with pivoted buckets and consisting of a bottom flight located within the barge and arranged beneath the bins or compartments, the upright ascending and descending flights supported by the tower, and the intermediate rearwardly-extending flight, a chute supported by the tower, dumping mechanism located at the top of the tower for discharging the contents of the buckets into the chute, a reversing-cam arranged at the back of the intermediate rearwardly-extending flight of the conveyer and adapted to swing the buckets from a position beneath the conveyer to a point above the same, operating mechanism for opening and closing the cut-offs independently of one another, and hydraulic rams for actuating the dumping-gates, substantially as described.

45. In an apparatus for handling material in bulk, the combination of a barge having bins or compartments provided with cut-offs and having dumping-gates, a tower having an opening, an endless conveyer provided with pivoted buckets and consisting of a bottom flight arranged beneath the bins or compartments, and upright ascending and descending flights located at the front and back of the tower and supported by the same, a chute depending from the top of the tower and arranged to swing through the same and through the endless conveyer, dumping mechanism located at the top of the tower, a reversing-cam arranged at the back of the barge for changing the position of the buckets before the same enter the barge, operating mechanism for opening and closing the cut-offs independently of one another, hydraulic rams arranged in pairs and connected with the dumping-gates, and compensating valves connecting the rams of each pair, substantially as and for the purpose described.

46. In an apparatus for handling material in bulk, the combination of a barge having bins or compartments provided with cut-offs and having dumping-gates, a tower having an opening, an endless conveyer provided with pivoted buckets and consisting of a bottom flight located beneath the bins or compartments and upright ascending and descending flights supported by the tower and arranged at the front and back of the same, a chute depending from the top of the tower and arranged to swing through the same and through the endless conveyer, dumping mechanism arranged at the top of the tower, a reversing-cam located at the back of the barge for changing the position of the buckets before they reënter the said barge, operating mechanism for opening and closing the cut-offs independently of one another, hydraulic rams connected with and adapted to actuate the dumping-gates, and trimmers arranged at intervals above the bottom flight of the endless conveyer to remove the surplus material from the buckets, substantially as described.

47. In an apparatus for handling material in bulk, the combination of a barge having bins or compartments provided with cut-offs and having dumping-gates, a tower having an opening, an endless conveyer provided with pivoted buckets and consisting of a bottom flight located beneath the bins or compartments, and upright ascending and descending flights supported by the tower and arranged at the front and back of the same, chutes depending from the top of the tower and arranged to swing through the same and through the endless conveyer, dumping mechanism located at the top of the tower, a winch, flexible connections extending from the winch to the chutes and located at opposite sides of the tower, operating mechanism for opening and closing the cut-offs, hydraulic rams connected with the dumping-gates, and means for operating the rams for opening and closing the dumping-gates independently of one another, substantially as described.

48. In an apparatus for handling material in bulk, the combination of a barge having bins or compartments provided with cut-offs and having dumping-gates, a tower mounted on the barge and having an opening, an endless conveyer provided with pivoted buckets and consisting of a bottom flight located beneath the bins or compartments, and upright ascending and descending flights supported by the tower and arranged at the front and back of the same, operating mechanism for opening and closing the cut-offs, hydraulic rams connected with the dumping-gates, the movable chutes depending from the top of the tower and arranged to swing through the same and through the endless conveyer, a winch, flexible connections extending from the winch to the chutes and located at opposite sides of the tower, dumping mechanism located at the top of the tower, and a reversing-cam arranged to change the position of the buckets before the latter enter the barge, substantially as described.

49. In an apparatus for handling material in bulk, the combination of a barge provided with bins or compartments having cut-offs and provided with dumping-gates, a tower mounted on the barge and having an opening, an endless conveyer having pivoted buckets and consisting of a bottom flight located beneath the bins or compartments, and upright ascending and descending flights supported by the tower and located at the front and back of the same, chutes depending from the top of the tower and arranged to swing through the same and through the endless conveyer, a winch having a series of drums, flexible

connections located at opposite sides of the tower and extending from the chutes to the drums, operating mechanism for opening and closing the cut-offs independently of one another, dumping mechanism arranged at the top of the tower, a reversing-cam for changing the position of the buckets, a safety-stop located above one of the flights of the conveyer and normally held out of contact with the same, and a trimmer for removing the surplus material, substantially as described.

50. In an apparatus for handling material in bulk, the combination of a barge having bins or compartments provided with cut-offs, a superimposed chute, a conveyer extending from the barge to the chute, a shaft extending longitudinally of the bins or compartments, a series of arms connected with the cut-offs, means for coupling the arms to the shaft, whereby one or more of the cut-offs may be opened and closed when the shaft is actuated, stops arranged in pairs for limiting the inward and outward movement of the cut-offs, and means for rocking the shaft, substantially as described.

51. In an apparatus for handling material in bulk, the combination with a conveyer, of bins or compartments having cut-offs, a shaft, a series of arms connected with the cut-offs, devices for coupling the arms to the shaft, brackets, the links slidably connected with the brackets and having their inward movement limited by the same to limit the inward movement of the cut-offs, and means for rocking the shaft, substantially as described.

52. In an apparatus for handling material in bulk, the combination of bins or compartments, an endless conveyer having a bottom flight located beneath the bins or compartments, cut-offs arranged at the bottom of the bins or compartments, a series of arms loosely mounted and arranged at an inclination and connected with the cut-offs, a shaft, couplings for connecting the arms with the shaft, links extending from the cut-offs and provided with openings, and the brackets provided with projections extending into the openings of the links, whereby the latter are slidably connected with the brackets to limit the inward and outward movement of the cut-offs, substantially as described.

53. In an apparatus for handling material in bulk, the combination of a barge, a superimposed chute, an endless conveyer extending from the barge to the chute and passing over the same and permitting the chute to swing through it from one side of the barge to the other, said conveyer being provided with a bottom flight located within the barge, a drive-wheel engaging the conveyer at one end of the bottom flight, and a guard-arm located above the bottom flight, adjacent to the drive-wheel and arranged to be engaged by the conveyer to free the latter, substantially as described.

54. In an apparatus for handling material in bulk, the combination of a barge, an endless conveyer having pivoted buckets and provided with wheels, drive-wheels arranged to receive and engage the wheels of the conveyer, and a guard located above one of the flights of the conveyer and arranged between the drive-wheels in position to be engaged by the conveyer as the buckets leave the drive-wheel, whereby the said conveyer will be freed from its engagement with the drive-wheel, substantially as described.

55. In an apparatus for handling material in bulk, the combination of a barge, a superimposed chute, an endless conveyer provided with pivoted buckets and having wheels, drive-wheels arranged to engage the wheels of the conveyer, and a guard extending longitudinally of the adjacent flight of the conveyer and located between the drive-wheels and arranged to be engaged by the said conveyer to free the same from the said drive-wheels, substantially as described.

56. In an apparatus for handling material in bulk, the combination of a barge, a superimposed chute, an endless conveyer provided with wheels, drive-wheels engaging the wheels of the conveyer, rails receiving the wheels of the conveyer and spaced from the drive-wheels, and guide-plates located at opposite sides of the conveyer and connecting the rails and adapted to hold the endless conveyer against lateral movement, substantially as described.

57. In an apparatus for handling material in bulk, the combination of a barge, an endless conveyer provided with wheels, guide-wheels receiving the wheels of the conveyer, a superimposed chute, rails extending from opposite sides of the guide-wheels and arranged to receive the wheels of the conveyer, and the guide-plates located at opposite sides of the conveyer adjacent to the guide-wheels and adapted to hold the conveyer against lateral movement, substantially as described.

58. In an apparatus for handling material in bulk, the combination of a barge, a superimposed chute, a conveyer having an ascending flight and provided with wheels, guide-wheels located at the lower end of the ascending flight of the conveyer, rails arranged in pairs and extending from the top and bottom of the guide-wheels, and the upper and lower guide-plates arranged adjacent to the guide-wheels and adapted to hold the conveyer against lateral movement on the guide-wheels, and capable of guiding the conveyer-wheels to the rails, substantially as described.

59. In an apparatus for handling material in bulk, the combination of a bin or compartment, a superimposed chute, an endless conveyer having an ascending flight for conveying material upward from the bin or compartment to the chute, said conveyer being also provided with a horizontal flight, and a safety-stop located above and normally held out of contact with the upper horizontal flight of the endless conveyer, and arranged to be thrown into engagement by the backward

movement of the conveyer and capable of locking the same against such backward movement after it engages the same, substantially as described.

60. In an apparatus for handling material in bulk, the combination of a bin or compartment having a series of movable cut-offs, an endless conveyer, a chute, a shaft extending longitudinally of the series of cut-offs, loosely-mounted arms arranged on the shaft and connected with the cut-offs, couplings for locking the arms to the shaft, a steam-cylinder connected with and adapted to rock the shaft, and operating mechanism for controlling the said couplings, substantially as described.

61. In an apparatus for handling material in bulk, the combination with a bin or compartment, a superimposed chute, and a conveyer extending from the bin or compartment to the chute, of a dumping-gate arranged to swing upward and downward, hydraulic rams for actuating the dumping-gate, and a compensating valve connected with the rams, substantially as described.

62. In an apparatus for handling material in bulk, the combination of a longitudinal series of bins or compartments provided with hinged dumping-gates, a chute, a conveyer extending from the bins or compartments to the chute, hydraulic rams arranged in pairs and connected with the dumping-gates and capable of yielding to the swinging movement of the same, compensating valves connecting the rams of each pair, and means for automatically operating the compensating valves to vary the power of the rams to correspond to the disposition of the material on the dumping-gates, substantially as described.

63. In an apparatus for handling material in bulk, the combination of a series of bins or compartments provided with dumping-gates, hydraulic rams arranged in pairs, compensating valves connecting the rams, and connections between the compensating valves and the dumping-gates, substantially as and for the purpose described.

64. In an apparatus for handling material in bulk, the combination of a bin or compartment having a sliding cut-off or door, a conveyer, a shaft, an arm loosely mounted on the shaft and connected with the cut-off or door, means for connecting the arm with the shaft and for operating the latter, a link connected with the door or cut-off, and means for engaging the link to limit the inward and outward movement of the sliding door or cut-off, substantially as described.

65. In an apparatus for handling material in bulk, the combination of an endless conveyer, a drive-wheel engaging the endless conveyer, and the guard comprising an approximately horizontal bar located above the endless conveyer, and a brace extending upward from the bar, substantially as described.

66. In an apparatus for handling material in bulk, the combination of a bin or compartment, an endless conveyer provided with wheels, rails receiving the wheels of the conveyer, drive-wheels interposed between the rails, and guide-plates for holding the endless conveyer against lateral movement, substantially as described.

67. In an apparatus for handling material in bulk, the combination of a conveyer provided with wheels, a longitudinal series of bins or compartments, drive and guide wheels located at the ends of the series of bins or compartments, rails spaced from the drive and guide wheels and receiving the wheels of the conveyer, a guard located between the drive-wheels and arranged above the conveyer and adapted to free the same from the said drive-wheels as the buckets leave the latter, and guide-plates located at the spaces between the rails adjacent to the drive and guide wheels and holding the conveyer against lateral movement, whereby the wheels of the conveyer are guided to the rails, substantially as described.

68. In an apparatus for handling material in bulk, the combination of a barge having a tower, the front and rear chutes depending from the tower, an endless conveyer provided with pivoted buckets and having one of its flights located above the chutes, the scale-casings mounted above the chutes and provided each with a pair of rigid spouts and having a movable cut-off for closing either of the spouts, and the front and rear dumping-blocks mounted on the scale-casings and arranged to discharge the contents of the buckets alternately in the front and rear scale-casings, substantially as described.

69. In an apparatus for handling material in bulk, the combination of a barge, a tower composed of front and rear legs and a connecting top portion, an endless conveyer having pivoted buckets and consisting of a bottom horizontal flight located within the barge at the bottom thereof, the front ascending flight adapted to carry material upward from the barge, the rear descending flight connected with the said flights and located at the back of the tower, a movable chute depending from the top of the tower and arranged to swing through the same, a scale-casing mounted within the top of the tower and located above the chute, a dumping-block arranged at the top of the scale-casing and adapted to be engaged by the pivoted buckets, and a reversing-cam to change the position of the buckets as the latter enter the barge, substantially as described.

70. In an apparatus for handling material in bulk, the combination of a barge, a tower composed of front and rear legs and a connecting top portion, an endless conveyer having pivoted buckets and consisting of a bottom horizontal flight located within the barge at the bottom thereof, the front ascending flight adapted to carry material upward from the barge, the rear descending flight connected with the said flights and located at the back of the tower, a movable chute depending from

the top of the tower and arranged to swing through the same, a scale-casing mounted within the top of the tower and located above the chute, a dumping-block arranged at the top of the scale-casing and adapted to be engaged by the pivoted buckets, and a trimmer arranged within the barge and arranged above the bottom flight of the conveyer, substantially as described.

71. In an apparatus for handling material in bulk, the combination of a barge, a tower composed of front and rear legs and a connecting top portion, an endless conveyer having pivoted buckets and consisting of a bottom horizontal flight located within the barge at the bottom thereof, the front ascending flight adapted to carry material upward from the barge, the rear descending flight connected with the said flights and located at the back of the tower, a movable chute depending from the top of the tower and arranged to swing through the same, a scale-casing mounted within the top of the tower and located above the chute, a dumping-block arranged at the top of the scale-casing and adapted to be engaged by the pivoted buckets, a reversing-cam arranged at the back of the barge to change the position of the buckets as the latter enter the said barge, and a trimmer arranged within the barge at the bottom thereof and located above the bottom flight of the conveyer, substantially as described.

72. In an apparatus for handling material in bulk, the combination of a barge, a tower composed of front and rear legs and a connecting top portion, an endless conveyer having pivoted buckets and consisting of a bottom horizontal flight located within the barge at the bottom thereof, the front ascending flight adapted to carry material upward from the barge, the rear descending flight connected with the said flights and located at the back of the tower, a movable chute depending from the top of the tower and arranged to swing through the same, a scale-casing mounted within the top of the tower and located above the chute, a dumping-block arranged at the top of the scale-casing and adapted to be engaged by the pivoted buckets, a drive-wheel located within the barge at the bottom thereof, and a guard located within the barge adjacent to the drive-wheel and arranged above the bottom flight of the conveyer, substantially as described.

73. In an apparatus for handling material in bulk, the combination of a barge, a tower composed of front and rear sides or legs and having a top connecting portion, a chute depending from the top of the tower, the endless conveyer provided with buckets and consisting of a bottom horizontal flight located within the barge, the ascending and descending upright flights, and the rearwardly-extending intermediate flight connecting the descending upright flight, the drive and guide wheels arranged within the barge at the ends of the horizontal bottom flight, and the guard located above the bottom flight and arranged adjacent to the drive-wheel, substantially as described.

74. In an apparatus for handling material in bulk, the combination of a barge, a tower composed of front and rear sides or legs and having a top connecting portion, a chute depending from the top of the tower, the endless conveyer provided with buckets and consisting of a bottom horizontal flight located within the barge, the ascending and descending upright flights, and the rearwardly-extending intermediate flight, the drive and guide wheels located within the barge at the stern and bow of the same, and the guide-plates located at opposite sides of the conveyer at the ends of the horizontal flight and arranged adjacent to the said wheels and adapted to hold the conveyer against lateral movement, substantially as described.

75. In an apparatus for handling material in bulk, the combination of a barge, a tower, an endless conveyer provided with buckets and having a horizontal flight arranged within the barge at the bottom thereof, said conveyer extending to the top of the tower, the guide and drive wheels arranged at the bow and stern of the barge at the ends of the horizontal flight of the conveyers, the guide-plates located at opposite sides of the horizontal flight of the conveyer and adapted to prevent the same from moving laterally, and the guard arranged within the barge at the stern thereof and located above the horizontal flight of the conveyer adjacent to the drive-wheel, substantially as described.

76. In an apparatus for handling material in bulk, the combination of a barge, a tower, an endless conveyer provided with buckets and extending from the barge to the tower and having a horizontal flight arranged within the barge at the bottom thereof, said conveyer being provided at opposite sides with wheels, the drive and guide wheels arranged in pairs and located within the barge at the ends of the horizontal flight of the conveyer, rails spaced from the drive and guide wheels and receiving the wheels of the conveyer, and the guard-plates located at the spaces between the rails adjacent to the drive and guide wheels and holding the conveyer against lateral movement, substantially as described.

77. In an apparatus for handling material in bulk, the combination of a tower, a chute depending from the tower, an endless conveyer extending from the barge to the tower and having a horizontal flight located within the barge at the bottom thereof, said conveyer being also provided at opposite sides with wheels, drive and guide wheels located within the barge at the ends of the horizontal bottom flight of the conveyer, the rails spaced from the guide and drive wheels, the guide-plates located at the spaces between the rails and holding the conveyer against lateral movement at the guide and drive wheels, and a

guard located above the bottom flight of the conveyer and arranged between the drive-wheels, substantially as described.

78. In an apparatus for handling material in bulk, the combination of a barge, a tower, movable chutes depending from the tower and composed of extensible sections, the booms hinged to the tower and located above the chutes, an endless conveyer extending from the barge to the chutes, the flexible connections 189 and 190, depending from the drums and connected with the sections of the chutes, the flexible connections 185 extending longitudinally of the chutes and connected with the lower sections thereof, and a series of drums connected with the said flexible connections 185, 189 and 190, substantially as described.

79. In an apparatus for handling material in bulk, the combination with a bin having a dumping-gate, and a conveyer arranged beneath the dumping-gate, of a pair of rams connected with the dumping-gate, a compensating valve connecting the rams, and means for connecting the compensating valve with the dumping-gate, whereby the said valve will be automatically controlled to vary the power of the rams, substantially as described.

80. In an apparatus for handling material in bulk, the combination with a movable dumping-gate, of rams connected with the dumping-gate, a compensating valve connected with the rams, connections between the compensating valve and the dumping-gate for operating the former automatically, and means for operating the equalizing-valve by hand, substantially as described.

81. In an apparatus for handling material in bulk, the combination of a barge having a series of bins or compartments provided with centrally-arranged cut-offs and having dumping-gates located at opposite sides of the cut-offs, rams located at opposite sides of the cut-offs and arranged in pairs and having their plungers connected with the dumping-gates, compensating valves located between the rams of each pair and connecting the same, connections between the compensating valves and the dumping-gates for operating the former automatically, and operating mechanism for enabling the valves to be operated by hand independently of one another, substantially as described.

82. In an apparatus for handling material in bulk, the combination of a barge, a tower, an endless conveyer extending from the barge to the tower and having upright flights at the front and back of the same and provided in rear of the tower with an intermediate horizontal flight, and a safety-stop located above the intermediate horizontal flight and normally held out of contact with the same, substantially as described.

83. In an apparatus for handling material in bulk, the combination of a barge, a tower, an endless conveyer extending from the barge to the tower, and a safety-stop normally held out of contact with the conveyer and arranged to lock the same against backward movement, substantially as described.

84. In an apparatus for handling material in bulk, the combination of a barge, a tower mounted on the barge and having an opening, a conveyer having flights at the front and back of the tower and extending to the top thereof, booms arranged at opposite sides of the tower, a chute supported by the tower and arranged to swing through the opening thereof to arrange it at either side of the barge, and means for connecting it with either boom, substantially as described.

85. In an apparatus for handling material in bulk, the combination of a barge, a tower mounted on the barge and having an opening, a conveyer extending to the top of the barge and having flights arranged at the front and back of the same, a chute depending from the top of the tower and arranged to swing through the same and through the conveyer, flexible connections arranged at opposite sides of the tower and provided with means for engaging the chute, and a winch arranged adjacent to the opening of the tower and provided with drums adapted to receive the said flexible connections, substantially as described.

86. In an apparatus for handling material in bulk, the combination of a barge, a tower, a conveyer extending from the barge to the tower, a superimposed chute supported by the tower and arranged to swing to either side of the barge, flexible connections arranged at opposite sides of the tower and adapted to be connected with the chute to support the same at either side of the barge, and a winch having drums adapted to receive the flexible connections at either side of the tower, substantially as described.

87. In an apparatus for handling material in bulk, the combination of a barge, a tower having an opening, a conveyer extending from the barge to the tower, a chute depending from the top of the tower and arranged to swing through the opening, a winch mounted within the opening of the tower, and means for connecting the winch with the chute when the latter is at either side of the barge, substantially as described.

88. In an apparatus for handling material in bulk, the combination of a barge, a tower having an opening, a conveyer arranged to carry material from the barge to the tower, a superimposed chute arranged to swing through the opening of the tower, a winch mounted within the opening of the tower, and the flexible connections arranged at opposite sides of the tower and adapted to be connected with the chute and the winch for supporting the former at either side of the tower, substantially as described.

89. The combination of a barge, a tower having an opening, a conveyer, booms located at opposite sides of the tower, a superimposed chute supported by the tower and ar-

ranged to swing through the same and composed of sections, a winch mounted within the opening of the tower, and the two sets of flexible connections located at opposite sides of the tower and connected with the booms, either set being adapted to be connected to the chute and to the winch, substantially as described.

90. In an apparatus for handling material in bulk, the combination of a barge, a tower having an opening, a conveyer, the horizontally-swinging booms arranged at opposite sides of the tower, the superimposed chutes supported by the tower and arranged to swing through the opening thereof and composed of sections, a winch mounted within the opening of the tower and provided with a series of drums, and the two sets of flexible connections located at opposite sides of the tower and connected with the booms and provided with means for detachably engaging the chutes and the drums whereby either set may be used, substantially as described.

91. In an apparatus for handling material in bulk, the combination of a tower having an opening, a chute depending from the top of the tower and arranged to swing through the opening, flexible connections located at opposite sides of the tower, either set being adapted to be attached to the chute, and a winch located in the opening of the tower and adapted to receive either set of flexible connections, substantially as described.

92. In an apparatus for handling material in bulk, the combination of a tower having an opening, a chute depending from the top of the tower and arranged to swing through the opening, booms mounted on the tower at opposite sides thereof, flexible connections mounted on the booms and adapted to engage the chute, either set of flexible connections being adapted to be connected with the chute to support the same in position for use, and a winch mounted in the opening of the tower and adapted to receive either set of flexible connections, substantially as described.

93. In an apparatus for handling material in bulk, the combination of a tower having an opening, a superimposed chute depending from the top of the tower and mounted within the opening thereof and having a pivotal and rotary movement whereby it is adapted to swing both longitudinally and transversely to arrange it at any desired position at either side of the tower, and booms hinged to the tower above the openings thereof and arranged to swing horizontally and provided with means for supporting the chute, substantially as described.

94. In an apparatus for handling material in bulk, the combination of a barge provided with a series of bins or compartments, a tower, a superimposed chute suspended from the tower, a conveyer extending from the barge to the tower and having a horizontal flight located beneath the bins or compartments, and a series of trimmers arranged between the horizontal flight and the bins or compartments, substantially as described.

95. In an apparatus for handling material in bulk, the combination of a barge provided with a series of bins or compartments, a conveyer having a flight extending beneath the bins or compartments, and a series of trimmers interposed between the bins or compartments and the conveyer, substantially as described.

96. In an apparatus for handling material in bulk, the combination of a barge having a series of bins or compartments, a tower arranged at the front of the barge, an endless conveyer composed of a horizontal flight arranged beneath the bins or compartments, upright flights arranged at the front and back of the tower, and an intermediate horizontal flight located above the barge in rear of the tower, a series of trimmers interposed between the bins or compartments and the lower horizontal flight, a superimposed chute, and a safety-stop located above the intermediate horizontal flight and normally held out of contact with the same, substantially as described.

97. In an apparatus for handling material in bulk, the combination of a barge having a series of bins or compartments, a tower arranged at the front of the barge, an endless conveyer having pivoted buckets and composed of a horizontal flight arranged at the bottom of the barge beneath the bins or compartments, the upright flights arranged at the front and back of the tower, and the intermediate horizontal flight extending rearward from the tower, a series of trimmers interposed between the bins or compartments and the bottom horizontal flight of the conveyer, and a reversing-cam arranged at the back of the intermediate horizontal flight for changing the position of the buckets as they enter the barge, substantially as described.

98. In an apparatus for handling material in bulk, the combination of a barge having bins or compartments, a tower, a superimposed chute suspended from the tower, a conveyer having pivoted buckets and extending from the barge to the tower, dumping mechanism located at the top of the tower over the chute, and a reversing-cam arranged at the back of the barge to change the position of the buckets as they enter the latter, substantially as described.

99. In an apparatus for handling material in bulk, the combination of a barge, a tower having an opening, an endless conveyer having pivoted buckets and extending from the barge to the tower and having upright flights arranged at the front and back of the tower, and provided with an approximately horizontal flight located at the top of the tower, the buckets of the horizontal flight being normally in an upright position, a superimposed chute suspended from the top of the tower at a point beneath the conveyer and arranged to swing through the opening of the tower, and dumping mechanism arranged at the top

796
422

of the tower over the chute, substantially as described.

100. In an apparatus for handling material in bulk, the combination of a barge, a tower having an opening, an endless conveyer provided with pivoted buckets and composed of a bottom horizontal flight located within the barge, upright flights arranged at the front and back of the tower, and an intermediate flight extending from the tower to the stern of the barge, a chute suspended from the top of the tower and arranged to swing through the opening, dumping mechanism arranged at the top of the tower over the chute, and means located at the back of the intermediate flight for reversing the buckets as they enter the barge, substantially as described.

101. In an apparatus for handling material in bulk, the combination of a barge having a series of bins or compartments, a tower having an opening, an endless conveyer provided with pivoted buckets and composed of a bottom horizontal flight located within the barge beneath the bins or compartments, upright flights arranged at the front and back of the tower, and an intermediate horizontal flight extending rearward from the tower, a chute suspended from the tower and arranged to swing through the opening, dumping mechanism arranged at the top of the tower over the chute, a reversing-cam arranged at the rear portion of the intermediate flight for changing the position of the buckets as they enter the barge, and a series of trimmers interposed between the horizontal flight and the bins or compartments, substantially as described.

102. In an apparatus for handling material in bulk, the combination of a barge having a series of bins or compartments provided with dumping-gates, a tower, a superimposed chute, a conveyer extending from the barge to the tower, hydraulic rams connected with the dumping-gates, and means automatically operated by the dumping-gates for varying the power of the rams, substantially as described.

103. In an apparatus for handling material in bulk, the combination of a barge having a series of bins or compartments, a tower having an opening, a chute arranged at the opening, an endless conveyer having pivoted buckets and extending from the barge to the tower and passing over the chute, dumping mechanism arranged at the top of the tower over the chute, a series of trimmers arranged at the bottom of the bins or compartments, and means for successively discharging the contents of the bins or compartments into the conveyer, substantially as described.

104. In an apparatus for handling material in bulk, the combination of a barge having a longitudinal series of bins or compartments, a tower having an opening, a superimposed chute located at the opening, an endless conveyer having pivoted buckets and extending beneath the bins or compartments and over the chute, dumping mechanism arranged at the top of the tower over the chute, reversing mechanism arranged in rear of the dumping mechanism, a series of trimmers interposed between the bins or compartments and the conveyer, and a safety-stop arranged normally out of contact with the conveyer, substantially as described.

105. In an apparatus for handling material in bulk, the combination of a barge having a longitudinal series of bins or compartments provided with cut-offs, a tower, a chute suspended from the tower, a conveyer extending from the barge to the tower, dumping-gates arranged at opposite sides of the bins or compartments, hydraulic rams arranged in sets at opposite sides of the barge and connected with the dumping-gates, compensating valves connected with the rams of each set for varying the power of the same, means for operating the rams from the deck of the barge, and connections between the dumping-gates and the compensating valves, whereby the latter will be automatically controlled, substantially as described.

106. In an apparatus for handling material in bulk, the combination of a barge having a series of bins or compartments provided with cut-offs, a tower having an opening, an endless conveyer having pivoted buckets extending beneath the bins or compartments and from the barge to the tower, a chute suspended from the top of the tower at the opening thereof, dumping mechanism arranged at the top of the tower, a winch located in the opening of the tower and connected with the chute, means for operating the cut-offs from the deck of the barge, whereby the bins or compartments are successively opened, and trimmers located adjacent to the cut-offs, substantially as described.

107. In an apparatus for handling material in bulk, the combination of a barge, a tower, a superimposed chute supported by the tower, an endless conveyer extending from the barge to the chute, a series of trimmers arranged in the barge, dumping mechanism located at the top of the tower for emptying the contents of the conveyer into the chute, reversing mechanism located in rear of the tower, and a safety-stop, substantially as described.

108. In an apparatus for handling material in bulk, the combination of a barge, a tower, a superimposed chute supported by the tower, an endless conveyer extending from the barge to the tower and provided with pivoted buckets, dumping mechanism arranged at the top of the tower, reversing mechanism located in rear of the dumping mechanism, for raising the buckets in proper position for entering the barge, and means for holding the buckets in such position, substantially as described.

109. In an apparatus for handling material in bulk, the combination of a barge having a series of bins or compartments provided with independently-operable cut-offs, a tower, a superimposed chute supported by the tower,

a conveyer having pivoted buckets and extending from the barge to the tower, dumping mechanism located at the top of the tower, reversing mechanism for changing the position of the buckets to arrange them properly for entering the barge, and trimmers located within the barge, substantially as described.

110. In an apparatus for handling material in bulk, the combination of a barge having a series of bins or compartments, a tower, a superimposed chute, an endless conveyer having pivoted buckets and extending from the barge to the chute, dumping mechanism arranged at the top of the tower, reversing mechanism arranged in rear of the dumping mechanism, and means for successively discharging the contents of the bins or compartments in the conveyer, substantially as described.

111. In an apparatus for handling material in bulk, the combination of a barge provided with a series of bins or compartments and having cut-offs, a conveyer having a flight extending beneath the bins or compartments, a series of trimmers interposed between the bins or compartments and the conveyers, and operating mechanism extending from the deck of the barge to the cut-offs for operating the latter independently of one another, substantially as described.

112. In an apparatus for handling material in bulk, the combination of a barge, a tower, a superimposed chute, a conveyer having pivoted buckets and extending from the barge to the tower, dumping mechanism located at the top of the tower over the chute, a reversing-cam arranged at the back of the barge to change the position of the buckets as they enter the latter, and means for holding the buckets in such position until they enter the barge, substantially as described.

113. In an apparatus for handling material in bulk, the combination of a barge, a tower, a superimposed chute suspended from the tower, booms arranged at opposite sides of the tower, adjustable connections also located at opposite sides of the tower and depending from the booms and provided with means for detachably engaging the chute, and a winch adapted to be connected with either set of adjustable connections, substantially as described.

114. In an apparatus for handling material in bulk, the combination of a barge, a tower, a superimposed chute suspended from the tower, booms arranged at opposite sides thereof, adjustable connections located at opposite sides of the tower, and depending from the booms and provided with means for engaging the chute, a winch arranged to receive either set of adjustable connections, a conveyer provided with pivoted buckets and extending from the barge to the chute, dumping mechanism arranged at the top of the tower over the chute, and a reversing-cam for changing the position of the buckets as they enter the barge, substantially as described.

In testimony that I claim the foregoing as my own I have hereto affixed my signature in the presence of two witnesses.

PEETE B. CLARKE.

Witnesses:
JOHN FRENCH,
CHARLES ENGEL.

798

426-427

No. 718,092. PATENTED JAN. 13, 1903.

P. B. CLARKE.

SWIVEL CHUTE HEAD.

APPLICATION FILED JAN. 30, 1901.

NO MODEL. 2 SHEETS—SHEET 1.

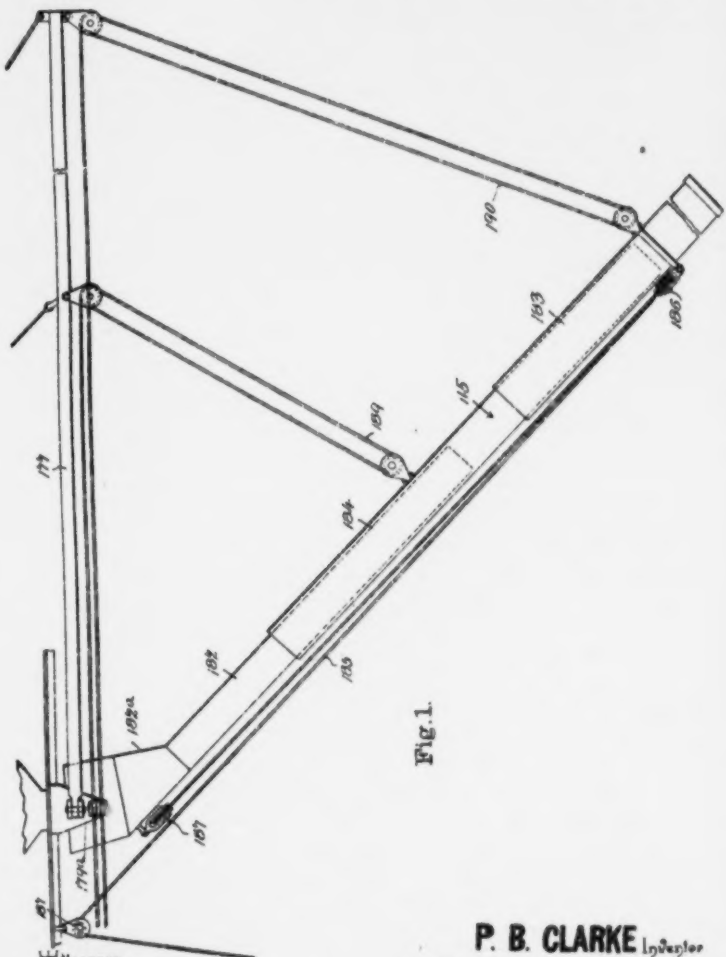


Fig. 1.

Witnesses
E. F. Stewart
T. A. Riley

P. B. CLARKE Inventor
by C. A. Snow & Co.
Attorneys

799

428–429

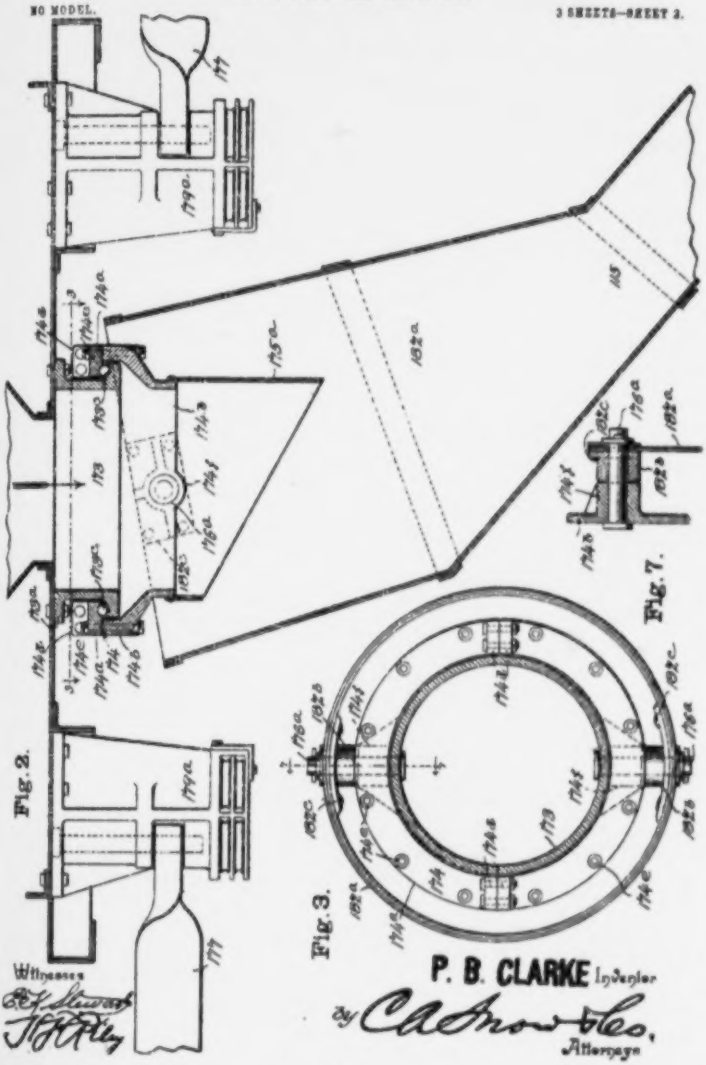
No. 718,092. PATENTED JAN. 13, 1903.

P. B. CLARKE.

SWIVEL CHUTE HEAD.

APPLICATION FILED JAN. 30, 1901.

NO MODEL. 3 SHEETS—SHEET 3.



800

430

No. 718,092. PATENTED JAN. 13, 1903.

P. B. CLARKE.

SWIVEL CHUTE HEAD.

APPLICATION FILED JAN. 30, 1901.

NO MODEL. 3 SHEETS—SHEET 3.

Fig. 4.

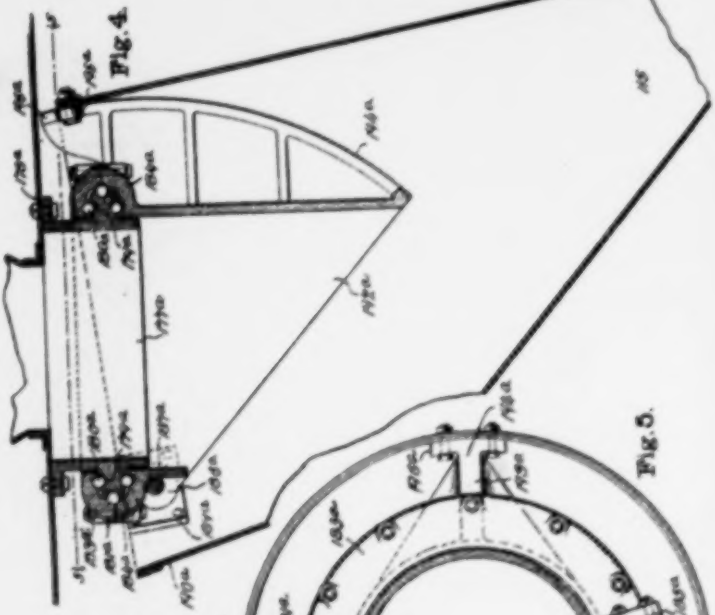


Fig. 5.

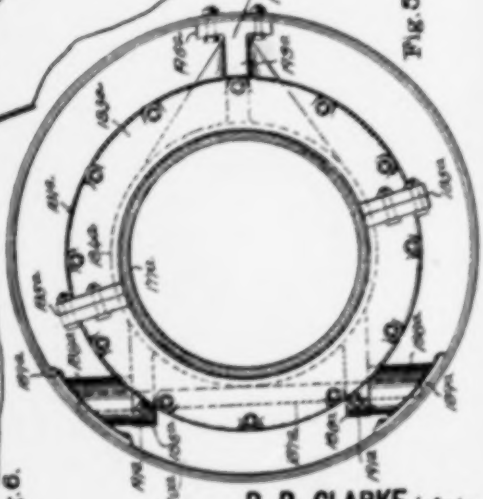
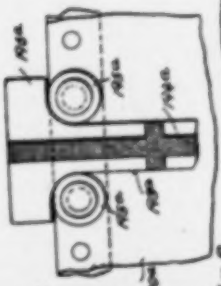


Fig. 6.



Witnesses

P. B. CLARKE Inventor

by C. A. Snow & Co.

Attorneys

801

431

UNITED STATES PATENT OFFICE.

PEETE B. CLARKE, OF NEW YORK, N. Y.

SWIVEL CHUTE-HEAD.

SPECIFICATION forming part of Letters Patent No. 718,092, dated January 13, 1903.

Application filed January 28, 1901. Serial No. 44,783. (No model.)

To all whom it may concern:

Be it known that I, PEETE B. CLARKE, a citizen of the United States, residing at New York, in the county of New York and State of New York, have invented a new and useful Swivel Chute-Head, of which the following is a specification.

The invention relates to a swivel chute-head for apparatus for handling material in bulk.

The object of the present invention is to provide for apparatus for handling material in bulk a swivel chute-head adapted to permit a superimposed chute to be swung upward and downward and capable of enabling the same to be rotated or swung horizontally, whereby the chute may be readily arranged in proper position for discharging the material.

A further object of the invention is to permit such adjustments of a chute without allowing any of the material to escape at the chute-head or joint between the chute and its support.

The invention consists in the construction and novel combination and arrangement of parts hereinafter fully described, illustrated in the accompanying drawings, and pointed out in the claims hereto appended.

In the drawings, Figure 1 is a side elevation of a chute having a swivel chute-head constructed in accordance with this invention. Fig. 2 is an enlarged vertical sectional view of the upper end or head of the chute. Fig. 3 is a horizontal sectional view on the line 3 3 of Fig. 2. Fig. 4 is a vertical sectional view, similar to Fig. 2, illustrating another form of the invention. Fig. 5 is a horizontal sectional view on line 5 5 of Fig. 4. Fig. 6 is a detail view illustrating the arrangement of the antifriction-rollers with relation to the curved guide. Fig. 7 is a detail sectional view on line 7 7 of Fig. 3.

Like numerals of reference designate corresponding parts in all the figures of the drawings.

115 designates a depending extensible chute adapted to swing vertically and horizontally and preferably composed of upper, lower, and intermediate sections 182, 183, and 184, which are adapted to slide or telescope to vary the length of the chute. The upper section 182 of the chute is provided with an enlarged end or top 182^a, tapering downwardly and pivotally connected by the means hereinafter described with a rotary bearing-sleeve 174, which is mounted on a supporting-neck 173. The annular supporting-neck 173 is provided with an upper attachment-flange 173^a and it has a lower bearing-flange 173^b, and the upper flange 173^a is perforated for the reception of bolts or other suitable fastening devices for securing the neck 173 to the support for the chute. The lower bearing-flange 173^b extends outward from the exterior of the neck 173 and is provided at its upper face with an annular groove forming a race for antifriction-balls 173^c, which enable the bearing-sleeve 174 to rotate frictionlessly on the supporting-neck 173. The bearing-sleeve 174 is composed of upper and lower rings 174^a and 174^b, and the ring 174^a is also composed of semicircular sections provided at their ends with abutting flanges 174^d, which are bolted or otherwise secured together, as clearly illustrated in Fig. 3 of the accompanying drawings. The upper bearing-ring 174^a is arranged above the bearing-flange 173^b of the supporting-neck 173, and it rests upon the antifriction-balls and extends outward beyond the same. The projecting portion of the upper bearing-ring 174^a is secured to the lower ring 174^b by an annular series of bolts 174^e or other suitable fastening devices arranged as clearly illustrated in Fig. 3. The lower ring 174^b has a contracted lower portion and is provided with a depending inner chute-section 175^a, extending downward into the enlarged upper end of the upper chute-section 182 and adapted to prevent the escape of material when the said chute-section 182 is in any position. The inner chute-section, which is tapering and which is disposed vertically, may be constructed separate from the lower ring, as illustrated in Fig. 2 of the accompanying drawings, or it may be formed integral, as hereinafter explained in connection with Fig. 4, and it is adapted to permit the chute 115 to swing on its pivot in either direction as far as possible without any liability of the material escaping through the chute head or connection. The lower ring is provided at opposite sides with tubular extensions 174^f, adapted to register with corresponding tubular extensions 182^b of the upper section 182 of the chute, and

802
432

these tubular extensions form eyes for the reception of pivots or pintles 176ᵃ, on which the chute 115 swings. The eyes or tubular extensions of the ring are preferably formed integral therewith, and the eyes or bearings 182ᵃ are preferably formed integral with plates 182ᵇ, which are riveted or otherwise secured to the enlarged upper end of the upper section 182 of the chute. The pivots, which are provided at their inner ends with heads, have suitable fastening devices at their outer ends for retaining them in alined eyes of the lower ring and the upper chute-section 182. By this construction the chute is pivoted to the bearing-sleeve at opposite sides thereof and the said bearing-sleeve is adapted to rotate on the supporting-neck. These movements will permit the chute to swing vertically and horizontally, whereby it may be arranged in the proper position for discharging the material handled.

In Figs. 4 to 6, inclusive, of the accompanying drawings is illustrated another form or modification of the invention in which a depending neck 177ᵃ is employed, and this depending neck is provided with an upper attachment-flange 178ᵃ, and it has a lower bearing-flange 179ᵃ, located between the upper and lower edges of the neck and provided at its upper, lower, and side faces with annular grooves forming ball-races for antifriction-balls 180ᵃ interposed between the bearing-flange and a bearing-sleeve 181ᵃ. The bearing-sleeve 181ᵃ is composed of upper and lower bearing-rings 183ᵃ and 184ᵃ, and the upper bearing-ring is sectional and is provided at the ends of its sections 185ᵃ with abutting flanges which are bolted or otherwise secured together, as clearly illustrated in Fig. 5 of the drawings. By constructing the upper bearing-ring of sections the bearing-sleeve is readily interlocked with the bearing-flange of the depending neck and the parts may be readily assembled. The lower bearing-ring of the bearing-sleeve is provided with a pair of rearwardly-extending eyes 186ᵃ, located at opposite sides of the bearing-sleeve and receiving a continuous pivot or pintle 187ᵃ, which extends beyond the eyes 186ᵃ into a pair of eyes 188ᵃ, formed integral with plates 189ᵃ, which are secured to an upper chute-section 190ᵃ, as clearly shown in Fig. 5. The bores of the eyes 188ᵃ of the upper chute-section are arranged opposite apertures or openings of the latter, and the pivot or pintle is retained in place by set-screws 191ᵃ, mounted in threaded perforations of the rearwardly-extending ears and engaging the pivot or pintle. The bearing-sleeve is provided with an inner tapering chute-section 192ᵃ, depending from and formed integral with the lower bearing-ring and provided at its front side with a curved guide 193ᵃ, consisting of a skeleton frame having a curved outer edge struck on an arc of which the pivot 187ᵃ is the center. The guide is provided at opposite sides with laterally-extending webs or flanges 194ᵃ, located between a pair of antifriction rollers or wheels 195ᵃ and provided at its top with a head 196ᵃ, forming laterally-extending stops arranged to be engaged by the antifriction rollers or wheels, as clearly illustrated in Fig. 6 of the accompanying drawings, when the upper section of the chute is at the limit of its movement in one direction and the guide is provided at its bottom with a suitable stop for limiting the movement of the chute in the opposite direction. The antifriction rollers or wheels 195ᵃ are mounted on the inner face of the upper section 190ᵃ of the chute and are located at the upper edge of the same, and they permit the chute to move freely and frictionlessly. The guide supports the chute and prevents the same from moving laterally and straining the pivot.

The chute is controlled by suitable ropes or cables designed to be operated by a winch (not shown) and connected with a boom 177, which is hinged at its inner end. A pair of booms are designed to be provided and are located at opposite sides of the upper end of the chute, as indicated in Fig. 2 of the accompanying drawings, suitable brackets 197ᵃ being provided for supporting the booms. The telescoping or sliding movement of the sections is controlled by a rope or cable 185, secured at one end to the upper section of the chute and extending longitudinally of the latter to a pulley 186 and passing therefrom rearwardly along the chute to a pulley 187. The pulley 186 is mounted on the lower section of the chute, and it will be apparent that by drawing in the cable or line 185 and by paying the same out the chute may be shortened or lengthened. The intermediate and lower sections of the chute are connected with the boom by means of ropes or cables 189 and 190. The rope or cable 189 is secured at one end to the boom at a point intermediate of the ends thereof, and it extends downward to the intermediate section and back to the boom, forming a supporting-loop, which is connected with the intermediate section 184 by a suitable block having a pulley. The other rope or cable 190 is arranged at the outer end of the boom and is connected in a similar manner with the lower or bottom section 183, and by drawing in the ropes or lines 189 and 190 and paying them out it will be clear that the chute may be swung upward and downward to arrange it at the desired elevation.

It will be apparent that the construction for supporting the depending chute is simple and comparatively inexpensive in construction, that it will permit the chute to be swung vertically and horizontally to arrange the same in the desired position, and that it will prevent the material from escaping at the top of the chute when the latter is in any position.

What I claim is—

1. A device of the class described comprising a support forming a conduit for the ma-

803

433–435

terial, a movable chute suspended from the support, and an inner chute-section mounted independently of the chute and located wholly within the latter, substantially as described.

2. A device of the class described comprising a support, a chute, and an inner chute-section mounted independently of the chute and located wholly within the same, substantially as described.

3. A device of the class described comprising a rotary bearing-ring, a chute pivotally connected with the bearing-ring, an inner chute-section mounted independently of the said chute, and means for supporting the bearing-ring, substantially as described.

4. A device of the class described comprising a support, a rotary bearing-ring, a chute pivotally connected to and carried by the rotary bearing-ring, and a tapering inner chute-section, extending downward below the bearing-ring and mounted independently of the said chute, substantially as described.

5. A device of the class described comprising a supporting-neck having a bearing-flange, a bearing-sleeve interlocked with the neck and composed of upper and lower bearing-rings, the upper bearing-ring consisting of sections, and a chute pivotally suspended from the bearing-sleeve, substantially as described.

6. A device of the class described comprising a supporting-neck having a bearing-flange provided with upper, lower and outer ball-races, antifriction-balls arranged in the races, a rotary bearing-sleeve interlocked with the supporting-neck and receiving the bearing-flange and the said balls and composed of a sectional upper ring, and a lower ring secured to the upper ring, and a chute pivotally connected with the bearing-sleeve, substantially as described.

7. A device of the class described comprising a rotary bearing-sleeve provided with a curved guide, a chute pivotally connected with the bearing-sleeve and supported by the guide, and a supporting-neck receiving the bearing-sleeve, substantially as described.

8. A device of the class described comprising a support, a rotary bearing-sleeve, a chute pivotally connected with the rotary bearing-sleeve and carried by the same, and an upright guide having a curved outer face arranged to support the chute, substantially as described.

9. A device of the class described comprising a support, a rotary bearing-sleeve, a chute pivotally connected with the bearing-sleeve and carried by the same, a curved guide depending from the bearing-sleeve, and antifriction-wheels mounted on the chute and arranged to run on the guide, substantially as described.

10. A device of the class described comprising a support, a rotary bearing-sleeve, a chute pivotally connected with the bearing-sleeve at opposite sides of the back thereof, and a curved guide extending downward from the front of the bearing-sleeve and supporting the chute, substantially as described.

11. A device of the class described comprising a support, a rotary bearing-sleeve, a chute pivotally connected with the bearing-sleeve, a guide extending downward from the bearing-sleeve and provided at its ends with stops, and a pair of antifriction-wheels mounted on the chute and arranged at opposite sides of the guide, substantially as described.

12. A device of the class described comprising a support, a rotary bearing-ring, a chute pivotally connected with the bearing-ring, an inner chute-section extending downward from the bearing-ring, and a curved guide mounted on the bearing-ring and on the inner chute-section and supporting the chute, substantially as described.

13. A device of the class described comprising a rotary sleeve, and a chute pivotally connected with and supported by the sleeve, whereby it is adapted to be swung vertically and horizontally, and means for supporting the sleeve, substantially as described.

In testimony that I claim the foregoing as my own I have hereto affixed my signature in the presence of two witnesses.

PEETE B. CLARKE.

Witnesses:
JOHN FRENCH,
CHARLES ENGEL.

804

436

No. 721,215. PATENTED FEB. 24, 1903.

C. METZGER.

SUPPORT FOR CONVEYERS.

APPLICATION FILED SEPT. 30, 1902.

NO MODEL.

FIG. 1.

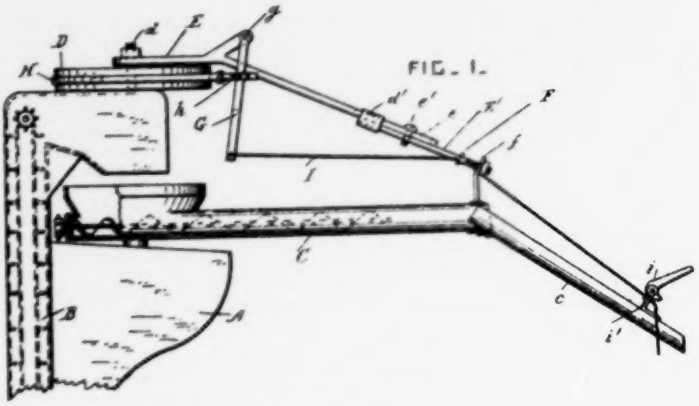


FIG. 2.

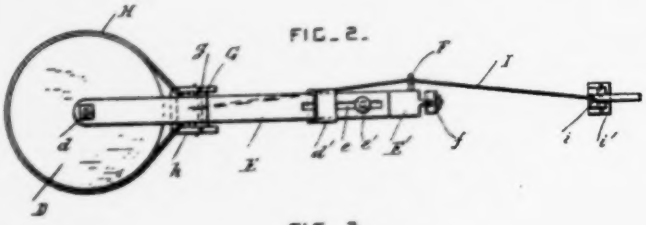
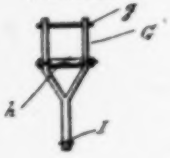


FIG. 3.



WITNESSES

Wm. H. Bates

R. H. Young

INVENTOR

Charles Metzger

by Robert N. Jones

Attorney

805

UNITED STATES PATENT OFFICE.

CHARLES METZGER, OF WHITTEMORE, IOWA.

SUPPORT FOR CONVEYERS.

SPECIFICATION forming part of Letters Patent No. 721,215, dated February 24, 1903.

Application filed September 26, 1902. Serial No. 124,977. (No model.)

To all whom it may concern:

Be it known that I, CHARLES METZGER, a citizen of the United States, residing at Whittemore, in the county of Kossuth and State of Iowa, have invented certain new and useful Improvements in Supports for Conveyers; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

This invention relates to supports for the conveyers used to deliver the grain from threshing-machines into wagons; and it consists in the novel construction and combination of the parts hereinafter fully described and claimed.

In the drawings, Figure 1 is a side view of the support, showing it in position. Fig. 2 is a plan view of the support. Fig. 3 is a detail view of the forked brake-lever.

A is a portion of the casing of a threshing-machine or grain-separator.

B is a portion of an elevator for raising the grain delivered by the machine.

C is a conveyer which receives the grain from the elevator B and delivers it into wagons. This conveyer is pivoted to the top part of the casing of the threshing-machine, so that it may be swung around to any convenient position, and it is provided with a hinged spout *c*.

All the above-mentioned parts are of any approved construction and do not form a part of the present invention.

The free end portion of the conveyer is usually supported by a cord, and it is usually necessary to tie it to the wagon to prevent it from swinging about and spilling the grain.

According to the present invention special means are provided for preventing the conveyer from swinging around when not desired without securing it to the wagon.

D is a stationary brake disk or wheel which is secured to the top of the elevator or other convenient position.

E is an arm which is pivoted by the pin *d* concentric with the disk D and in line with the pivot of the conveyer. This arm is preferably provided with an extensible section E', which slides against the main portion of the arm and is provided with suitable guides *d'* to keep it in alinement. One of the arm-sections is provided with a slot *e*, and *e'* is a screw for securing the two sections together after their length has been adjusted. The outer section E' is provided with a fastening *f* for securing it to the free end portion of the conveyer.

F is an eye which projects laterally from the free end portion of the section E'.

G is a forked brake-lever the upper end portion of which is pivoted by a pin *g* to the upper part of the arm E.

H is a brake-band which encircles the disk D and which has its ends pivotally connected to the middle part of the lever G by means of a yoke *h*.

I is a cord which is secured at one end to the lower end of the lever G. This cord is passed through the eye F, and its other end portion is connected to the free end portion of the hinged grain-spout *c* by means of a catch *i*. This catch preferably consists of a cam provided with a handle and pivoted in a bracket *i'*, which is secured to the spout. The cord passes between the cam and the bracket and is clamped by the said cam.

The support may be swung around to any position, and the spout may be set to any desired angle. The weight of the spout and the grain in it pulls the cord I and causes the brake-band to be pressed on the brake-disk by means of the forked brake-lever, so that when the machine is at work and grain is being delivered through the spout the conveyer is held stationary in one position and does not have to be tied to the receiving-wagon.

This device can be made and sold as an article of manufacture and can be applied to existing conveyers in place of the usual supporting-cord.

What I claim is—

1. In a support for a conveyer, the combination, with a brake-disk, of an arm pivoted concentric with the disk and provided with a fastening for engaging with the free end of a conveyer, a brake-band, a lever pivoted to the said arm and connected with the brake-band, and a flexible connection secured to the said lever and adapted to be connected with the grain-spout of the conveyer, substantially as set forth.

806

2. In a support for a conveyer, the combination, with a brake-disk, of an arm for supporting a conveyer pivoted concentric with the said disk, and automatic brake mechanism supported by the said arm and operating to secure it to the said disk when the conveyer is in operation, substantially as set forth.

3. In a support for a conveyer, the combination, with a brake-disk, of an extensible arm pivoted concentric with the disk and provided with a fastening for engaging with the free end of a conveyer, and automatic brake mechanism supported by the said arm and operating to secure it to the said disk when the conveyer is in operation, substantially as set forth.

4. In a support for a conveyer, the combination, with a brake-disk, of an arm for supporting the conveyer pivoted concentric with the said disk, a brake-band encircling the said disk, a brake-lever pivoted to the said arm and connected with the said band, a flexible connection connected to the said lever and supported by the said arm, and a catch for connecting the said flexible connection with the grain-spout, substantially as set forth.

In testimony whereof I affix my signature in presence of two witnesses.

CHARLES METZGER.

Witnesses:
GEORGE METZGER,
HENRY PRAMLACH.

807

440

No. 753,618. PATENTED MAR. 1, 1904.

T. NICHOLSON.

CONVEYER OR CHUTE FOR INFILLING MATERIAL.

APPLICATION FILED JULY 26, 1902.

NO MODEL.

Fig. 1.

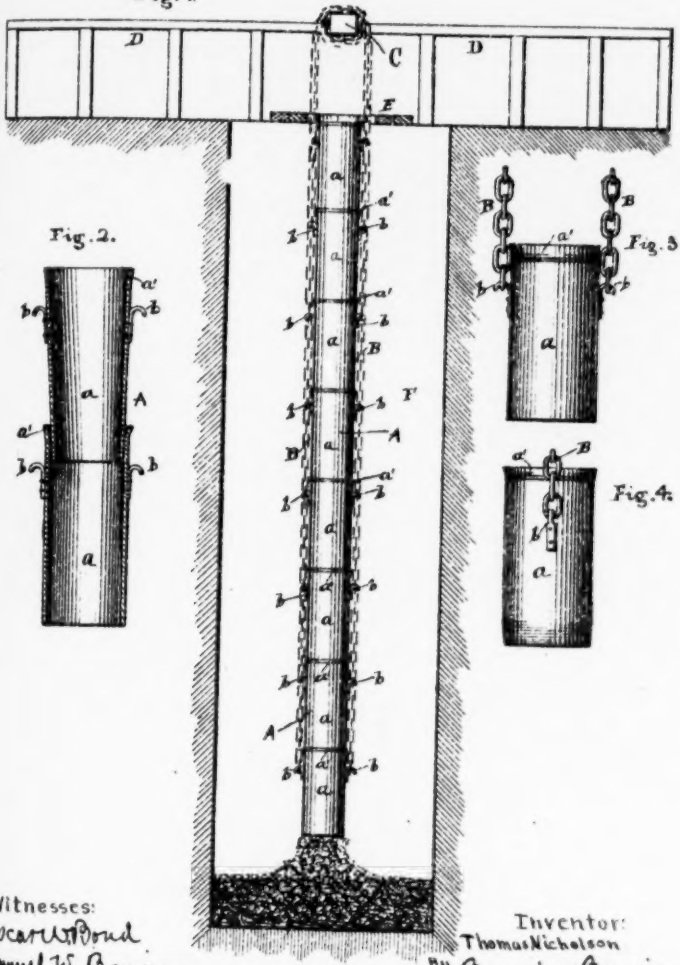


Fig. 2.

Fig. 3.

Fig. 4.

Witnesses:
Oscar W. Bond
Samuel W. Banning.

Inventor:
Thomas Nicholson
By Banning & Banning,
Atty's

808

441

No. 753,616. Patented March 1, 1904.

UNITED STATES PATENT OFFICE.

THOMAS NICHOLSON, OF CHICAGO, ILLINOIS.

CONVEYER OR CHUTE FOR INFILLING MATERIAL.

SPECIFICATION forming part of Letters Patent No. 753,616, dated March 1, 1904.

Application filed July 26, 1902. Serial No. 117,087. (No model.)

To all whom it may concern:

Be it known that I, THOMAS NICHOLSON, a citizen of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented a certain new and useful Improvement in Conveyers or Chutes for Infilling Material, of which the following is a specification.

This invention relates more especially to means for conveying or delivery concrete, cement, mortar, and other material to the bottom of excavations, pits, and other similar inaccessible places, and has for its object to construct a conduit or tube made up in sections readily detachable one from the other and constituting as a whole a continuous chute or conveyer through which the material will pass to be delivered at the end of the conveyer or chute, to so suspend and support the sectional conduit or tube as to enable the same to be swung as a whole laterally without interfering with its operation as a conveyer or chute, and to improve generally the construction, arrangement, and operation of the conveyer or chute as a whole.

The invention consists in the features of construction and combinations of parts hereinafter described and claimed.

In the drawings, Figure 1 is an elevation showing a hole to be filled with the conveyer or chute of the invention suspended therein and reaching nearly to the bottom thereof; Fig. 2, a sectional elevation showing one manner of interlocking one section of the conduit or tube with another; Fig. 3, an elevation of a single section of the conduit or tube, showing a manner of attachment to the suspending-chain; and Fig. 4, an elevation of a single section of the conduit or tube, likewise showing the attachment to the suspending-chain.

The conveyer A is formed of a sectional conduit or tube, each section *a* having a flaring end *a'*, into which is entered the end of the preceding section, so as to form a species of lap-joint or interlock of one section with another, the lap-joint or interlock furnishing a sufficiently-rigid connection between the sections to enable the conduit or tube as a whole to be swung laterally without breaking or disrupting the conveyer or chute, and it is preferred to have the lap or interlock on the inside, so as to present a smooth face for the downward passage of the material through the conveyer or chute. The sections can be made of sheet-iron or other sheet metal or light material of sufficient strength to withstand the wear and strain in use, and the sections can have a diameter of eight or ten inches and a length of four or five feet or such other diameter and length as may be desired, it being understood that the diameter and length should be such as to furnish a clear passage for the material through the conveyer or tube and to enable the lower section as the filling progresses upward to be readily detached and removed, so that the next preceding section will form the delivery end of the conveyer or chute. Each section of the conduit or tube in the arrangement shown has on opposite sides hooks or lugs *b* of a form to be readily entered into the links of the suspending-chains B, one chain being provided for each side of the conveyer or chute. Each chain is lapped around or otherwise attached in the arrangement shown to a supporting-beam C on a platform or framework D, but could be otherwise attached to the beam, or the chains could be tied or connected to any suitable support at the upper end so long as the connection and the manner of suspending the chain is one that will hold the sections of the conduit or tube entered one into the other and interlocked, so that the conveyer or chute can be swung laterally as may be required to deliver and distribute the material within the hole or excavation to be filled. The upper end of the conduit or tube terminates at the top of the excavation or hole to be filled, and in the arrangement shown a planking or covering E is placed over the mouth of the hole or excavation, with a suitable opening therein for the end of the conveyer or chute and the passage of the suspending chains.

In use the conveyer or chute A, of a length to suit the depth of the excavation or hole F which is to be filled, is made up or constructed by attaching the lowermost section of the conduit or tube by its ears *b* to a link of the

809

chain on each side. The next preceding section is entered at its lower end into the upper end *a* of the first section, and the second section is attached to the chains by its hooks *b*, and the third section is entered at its lower end into the upper end of the second section and its hooks *b* caught into a link of the chain on each side, and section after section is added until the conduit reaches the proper distance above the bottom of the hole or excavation to be filled for the material to discharge from the lower section with sufficient space to be spread and compacted or otherwise manipulated in the excavation or hole, as shown in Fig. 1, where the material is shown as discharging from the conveyer or chute. When the filling has nearly reached the lower end of the first section of the conduit or tube, such first section is unhooked from the suspending chains, and the second section then becomes the discharging-section, and when the filling has nearly reached the height of the lower end of this second section such section is unhooked and the third section becomes the discharging-section, and so on until the upper section is reached, and as each section is unhooked it is to be removed from the hole or excavation by means of a rope (not shown) or otherwise, and the unused ends of the chains can be attached to a cord or cords (not shown) by which can be raised the chains, so as to be kept clear of the filling as the material is discharged into the excavation or hole. The concrete, cement, mortar, or other material to be filled into the excavation or hole is to be mixed in any usual and well-known manner at the top of the ground and from the place of mixing is to be carried or deposited on the platform E, from which it can be easily shoveled or otherwise deposited into the top of the conveyer or chute to pass down therein. The suspending of the conveyer or chute from above by means of chains or other flexible means, so as to hold the sections engaged one with the other, enables the operator or workman at the bottom of the excavation, hole, or pit by taking hold of the lower end of the conduit or tube to swing the discharge end sidewise or laterally in any direction required for directing the material to any desired point and so as to evenly and uniformly distribute the material as it falls from the conveyer or chute.

It will be seen that with my invention a conveyer or chute is provided made up of a sectional conduit, tube, or pipe, each section of which is adapted to be independently supported by a suspending chain or other suspending means, so that one section can be readily detached when necessary, or a section can be added when desired without the requirement of any special skill in detaching or attaching a section and without any waste of time in so doing; that the conduit or tube, while made up of sections, has the sections engaging one with the other by an overlapped joint or interlock, forming, in effect, a continuous conduit or tube or pipe with sufficient rigidity to allow the conveyer or chute as a whole to be swung without breaking or destroying the continuity or interfering with the free passage downward and discharge of the material at the lower end; that as the material rises in the excavation, hole, or pit to be filled the lowermost section of the conduit, tube, or pipe can be detached, leaving a complete conveyer or chute for continuing the filling operation, and the removed or detached section can be withdrawn, leaving the filling space for the reception of the material, that the removable or detachable sections enable the conveyer or chute to be lengthened or shortened at any time without any trouble or inconvenience, it only being necessary for shortening to detach a section and for lengthening to attach a section of the conduit or tube, and that the material can be deposited at the bottom of the excavation, hole, or pit, and its discharge be directed to any point desired through the rigidity of the conveyer or chute, by which the discharge end thereof can be swung to any point desired, so as to deposit the material in a uniform and even manner.

While the suspending means shown are chains, one on each side, it is to be understood that other suitable means, such as looped or knotted cables, wire, or rope may be employed for suspending the sections, each independently, and have the suspension to form a continuous conduit or tube.

The sections of the conduit or tube can be of the same diameter throughout their length except the flare at the receiving end of each section for entering the end of the preceding section and with light material for constructing the sections. The flare will enable the entering end of the section to be forced into the receiving end of the section, the metal or material contracting sufficiently for this purpose, or the entering end could be slightly contracted to facilitate the entering, if so desired, and instead of each section having a body of the same diameter its entire length the body of each section could be made slightly tapering, as shown for the upper section in Fig. 2, which would not interfere with the passage of the material through the conduit or tube.

It will be understood that instead of removing successively each lower section to foreshorten the conduit or tube as the excavation, hole, or pit is filled the conduit or tube could be bodily raised and the upper sections successively removed, thus attaining the same result of a clear space at the lower or discharge end of the conveyer or chute.

The essential and important feature of the present invention is the construction of a conveyer or chute for depositing infilling material from or by means of a sectional conduit,

tube, or pipe the sections of which fit into each other snugly and tightly, giving a support at the joints and combining with such sectional conduit, tube, or pipe flexible suspending means which enable the conveyer or chute to be easily and readily swung at its lower end into discharging position as required, and while the invention has been described as to the construction of the conveyer or chute for infilling material somewhat minutely as to the details and arrangements of the various parts I do not intend thereby to limit myself to specific parts, details, or arrangement further than as the same are specified and called for in the claims, as it is the intention to make such changes in the several parts and elements as circumstances may render desirable or the work to be done may require without departing from the essential plan and features of the invention.

What I regard as new, and desire to secure by Letters Patent, is—

1. In a conveyer or chute for infilling material, the combination of a sectional conduit or tube having its sections detachably connected together and when connected having the entering ends of the sections interlocked one with the other, means for suspending the conduit or tube to hang free, and means for connecting each section independently and detachably to the suspending means, substantially as described.

2. In a conveyer or chute for infilling material, the combination of a sectional conduit or tube having its sections detachably connected together and when connected having close rigid joints at the entering ends of the sections, means for suspending the conduit or tube to hang free, and means for connecting each section independently and detachably to the suspending means, substantially as described.

3. In a conveyer or chute for infilling material, the combination of a conduit or tube consisting of a series of hollow cylindrical sections telescoped partially into each other at their adjacent ends and having rigid close joints at each of said telescopic connections, and means for suspending the conduit or tube and having the sections thereof independently and detachably connected thereto, whereby the conveyer or chute as a whole may be swung about at its lower end without pivotal or telescopic action at the joints and may be extended or shortened by the addition or removal of a section or sections, substantially as described.

4. In a conveyer or chute for infilling material, the combination of a conduit or tube consisting of a series of attachable and detachable hollow cylindrical sections having the same diameter and tapered to telescope partially into each other at their adjoining ends forming rigid joints when the sections are attached, means for suspending the conduit or tube to hang free, means for independently and detachably connecting the sections of the conduit or tube onto the suspending means, and a receiver for and from which the material can be introduced into the upper end of the conduit or tube to be discharged at the lower end thereof, substantially as described.

5. In a conveyer or chute for infilling material, the combination of a conduit or chute composed of separately-detachable sections rigidly connected together and having their ends telescoped into each other to make a tight joint and enable the conveyer or chute as a whole to be shifted bodily, laterally and vertically, means for suspending the conduit or tube to hang free, a support for the suspending means, and a receiver for and from which the material can be deposited into the upper end of the conduit or tube to be discharged at the lower end thereof, substantially as described.

6. In a conveyer or chute for infilling material, the combination of a sectional conduit or tube having its sections detachably connected together, and when connected having the entering ends of the sections interlocked, chains one on each side of the conduit or tube, a projecting catch on opposite sides of each section of the conduit or tube adapted to engage a link of the chain and detachably and independently connect each section of the conduit or tube to the chains, and a support for the chains at their upper ends, substantially as described.

THOMAS NICHOLSON.

Witnesses:
OSCAR W. BOND,
WALKER BANNING.

811

446–447

No. 760,015. PATENTED MAY 17, 1904.

F. E. PARKER.

STOREHOUSE CONVEYER FOR GRAIN, &c.

APPLICATION FILED NOV. 27, 1903.

NO MODEL. 2 SHEETS—SHEET 1.

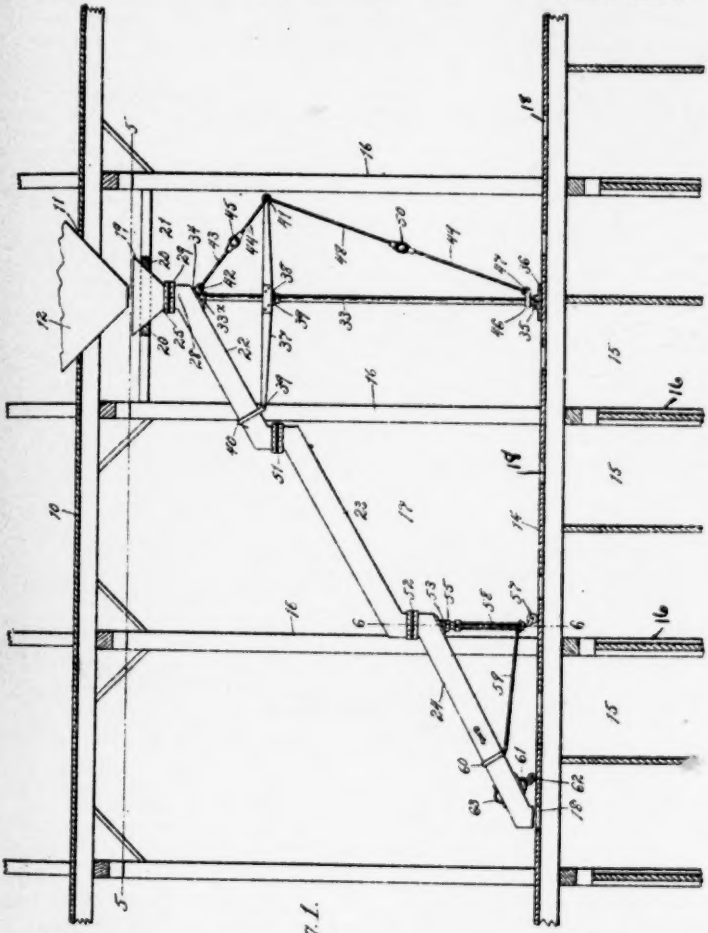


Fig. 1.

WITNESSES:

Robert A. Pollock

Theodore C. Sparkes.

INVENTOR.

Francis E. Parker

BY

Richard K. Manning

ATTORNEY.

812

448

No. 760,015. PATENTED MAY 17, 1904.

F. E. PARKER.

STOREHOUSE CONVEYER FOR GRAIN, &c.

APPLICATION FILED NOV. 27, 1903.

NO MODEL. 2 SHEETS—SHEET 2.

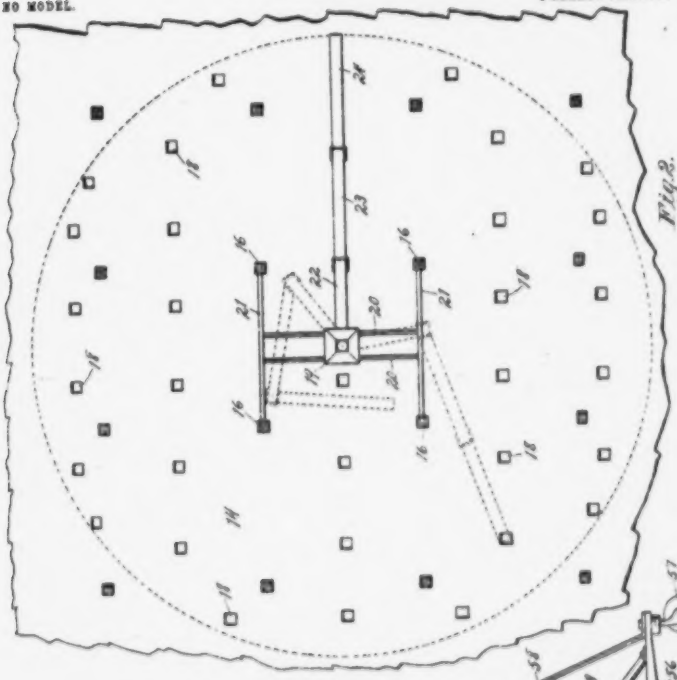


Fig. 2.

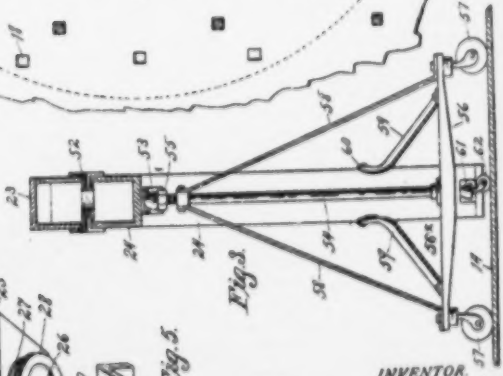


Fig. 3.



Fig. 4.



Fig. 5.

WITNESSES:

Robt. J. Pollock

Hudson C. Sparks.

INVENTOR.

F. Francis E. Parker

Richards & Manning

ATTORNEYS.

No. 760,015. Patented May 17, 1904.

UNITED STATES PATENT OFFICE.

FRANCIS E. PARKER, OF KANSAS CITY, MISSOURI, ASSIGNOR OF ONE-HALF TO JAMES C. MURPHY, OF KANSAS CITY, MISSOURI.

STOREHOUSE-CONVEYER FOR GRAIN, &c.

SPECIFICATION forming part of Letters Patent No. 760,015, dated May 17, 1904.

Application filed November 27, 1903. Serial No. 182,899. (No model.)

To all whom it may concern:

Be it known that I, FRANCIS E. PARKER, a citizen of the United States of America, residing at Kansas City, in the county of Jackson and State of Missouri, have invented certain new and useful Improvements in Storehouse-Conveyers for Grain, &c.; and I do hereby declare that the following is a full, clear, and exact description of the invention, such as will enable others to make and use the same, reference being had to the accompanying drawings, forming a part of this specification.

The object of my invention is to distribute by gravity the stored grain from the garner-floor of a storehouse to the various bins below and deploy the discharging end of the distributer within circles in the bays of the storehouse and from any point in the radius of a circle from its receiving end to support and adjust the separate portions of the distributer in position.

The invention consists in the novel construction and combination of parts, such as will be first fully described and then specifically pointed out in the claims.

In the drawings, Figure 1 is a view in vertical section of a portion of a storehouse for grain, showing separate garner and distributing floors, the hopper leading from the stored grain in the upper floor, the novel grain-distributer and its discharging end above the openings in the lower floor leading to one of the various bins. Fig. 2 is a horizontal sectional view taken upon the line 5 5 of Fig. 1. Fig. 3 is a rear view of the carriage supporting the lower discharging-section of the distributer, showing the adjusting devices, also showing a vertical section of the distributer through the joint of the connected parts, taken on the line 6 6 of Fig. 1. Figs. 4 and 5 are detail views of the castings forming the rotative joint at the ends of the spout-sections.

Similar numerals of reference indicate corresponding parts in all the figures of the drawings.

Referring to the drawings, 10 represents the upper or garner floor of the storehouse from which the grain is distributed. In the floor 10 is an opening 11; through which extends a short distance the lower end of a hopper 12. Beneath the floor 10 is a floor 14, and beneath the floor 14 are the series of bins 15. The floors 10 and 14 are supported by columns or standards 16, arranged in a vertical position one above another and at equal distances apart in the longitudinal and transverse directions of the storehouse, the rectangular spaces or bays 17 between the columns being directly above two or more bins below the floor 14, and in the floor 14 within each bay 17 are separate openings 18 18, each above and leading to a bin 15.

Near the under side of the floor 10 and beneath the lower end of the hopper 12 is a hopper 19. This hopper is supported by the horizontal bars 20 20, which extend upon opposite sides and retain the hopper in a fixed position, the ends of the bars 20 20 being connected rigidly with the bars 21 21 extending at right angles thereto and secured to the standards 16 16.

The novel grain-distributer comprises the jointed sections or spouts 22, 23, and 24, which have rotative and pivotal bearings, as hereinafter described, and each spout is rectangular in cross-section. The spout-section 22, which is directly beneath the hopper 19, is preferably short in length, so as to permit of a movement in a circle at its lower end within the space or bay between the column 16, supporting the hopper 19, and from which the hopper is equidistant. At the lower end of the hopper 19 is secured a rectangular-shaped casting or box 25, extending around the lower end of the spout, in which is an opening 26, as seen in Fig. 4. Upon the under side of the ca g and extending around the opening 26 is a collar 27, upon the lower edge of which is an annular outwardly-extending flange 28, which forms the upper portion of the spout-joint. The upper end of the spout-section 22 is bent upwardly at an angle thereto, as at 28, and upon the outer side of said portion 28 is secured a casting or box 29, divided transversely into two parts, one of which parts is seen in Fig. 5, the top 30 being provided with a semicircular opening 31, which fits part way around

the collar 27 of the box 25 and forms the rotative suspension-joint for the upper end of the spout-section. Supporting the under side of the upper end of the spout-section 22 is a vertical rod 33, the upper end of which is square and extends within a socket 33° upon a cap-plate 34, secured to the spout. The lower end of the rod is reduced circumferentially in size to form a pivot 35, which is stepped in the bearing 36 upon the upper surface of the floor 14.

Upon the rod 33 a short distance below the upper end of rod 33 is a horizontal cantaliver 37, which is clamped to the rod by a strap 38 on the side of the beam extending over the rod. The cantaliver is supported by a fixed collar 39 on the rod beneath the strap 38. The longer arm of the cantaliver extends in the direction of the lower end of the spout-section 22 and is secured by a rivet 39 to the connected ends of a band 40, extending around said spout-section. The shorter end of the cantaliver extending from the rod is provided with an eye 41. Upon the cap-plate 34 is cast an eye 42. With the eyes 41 and 42 are connected the outer ends of separate adjusting truss-rods 43 44, the inner ends of which are provided with right and left hand screw-threads, which extend within a threaded link 45. Upon the lower end of the rod 33 is a clasp 46, in which is an eye 47. With the eye 41 on the cantaliver and the eye 47 is connected the outer ends of the separate truss-rods 48 and 49, the inner ends being connected with the adjusting-link 50, which is the same as link 45.

The lower end of spout-section 22 is bent downwardly and the upper end of the intermediate spout-section 23 bent upwardly, and these ends are connected by rotative joint 51, which is precisely the same as the joints 25 and 29. The lower end of spout-section 23 is bent downwardly, and with this end is connected the upwardly-bent upper end of the lower spout-section 24 by means of a rotative suspension-joint 52, which is the same in construction as the joints 51.

Upon the under side of the rear end of the spout-section 24 is secured a socket-plate 53, within which extends loosely the screw-threaded upper end of a supporting-rod 54. Upon the screw-threaded end of said rod is an adjusting-nut 55. The lower end of the rod 54 extends downwardly and is connected rigidly with the horizontal beam 56 of the carriage 56°, at each end of which beam are the rotatable caster-wheels 57 57, which are movable over the floor 14. With the outer ends of the beam 56 are connected the lower ends of the brace-rods 58, the upper ends of which rods are rigidly connected with the upper end of the rod 54 below the screw-threaded portion. With the beam 56 are connected the rear ends of brace-bars 59, the forward ends of which bars extend in the direction of the lower end of the spout-section 24 and are connected with the ends of a strap 60, which extends over the upper side of the spout-section.

Upon the under side and near the forward end of the spout-section 24 is a socket-plate and socket 61, in which the caster-wheel 62 is mounted and which retains the downwardly-bent lower end of the spout-section the requisite distance above the surface of the floor. Upon the said section of the spout are handles 63.

The grain in the hopper upon the garner-floor 10 is fed from the hopper 12 and thence to the hopper 19. The distribution of the grain to any one of the bins 13 through the spout-sections 22 23 24 and any of the openings 19 in the floor 14 is obviously within the reach of the discharging end of the lower spout-section 24 without any inconvenience from the columns 16 within the circuit of the distributer. This result is obtained by the carriage 56° acting as the pivot for the jointed ends of the spout-sections 23 and 24 to effect rotation and also effecting the withdrawal of the spout-sections within the space or bay in which the hopper is located, and thence deploying the spout-section forward in any direction in the circle to effect conjunction with either end of the openings in the floor 14. In these movements the intermediate spout-section 23 affords a capability of movement independent of the other spout-sections, which conduces to rapid change of positions and obviously as suspended so admit of freedom of movement. The rapid passage of the grain through the spout-sections, which has a tendency to cause vibration, is counteracted by the cantaliver 37, and any slight inaccuracy in position of the spout-section is readily corrected by the adjusting-links 45 and 50 on the truss-rods 44 and 48, which latter rods prevent buckling of the vertical rod 33. Should the position of the rear end of the spout-section 24 require adjustment, to prevent binding of the joint 52 the nut 55 may be turned so as to effect the adjustment the nut ordinarily supporting the weight of the jointed spout-sections 23 and 24.

The invention is applicable to the distribution of material of various kinds, it being observed that in large storehouses one distributer accomplishes the spouting of large quantities of cereals of various kinds into separate and distinct bins in an expeditious manner.

Such modifications may be employed as are within the scope of the invention.

Having fully described my invention, what I now claim as new, and desire to secure by Letters Patent, is—

1. In a distributer for grain, &c., the combination with a hopper, of a distributing-spout and a rotative joint connecting the spout with the hopper, a pivoted supporting-rod beneath the upper end of the spout, a cantaliver on the said rod supporting at one end the forward end of the spout and adjustable truss-rods on

815
451–453

said supporting-rod connected with the other end of the cantaliver.

2. The combination with an elevated hopper, of a distributing-spout for grain, &c., having upper and lower and intermediate sectional parts, rotative suspension-joints connecting the contiguous ends of the separate parts of the spout with each other and also with the said hopper, a traveling support for the jointed ends of the lower and intermediate sectional parts of the spout, and means for raising and lowering said parts upon said support.

3. The combination with an elevated hopper, of a distributing-spout having upper and lower and intermediate sectional parts, rotative suspension-joints connecting the contiguous ends of the separate parts of the spout with each other and also with said hopper, a carriage beneath the jointed ends of the lower and intermediate sectional parts of the spout, a rod connected with the carriage and supporting said jointed ends of the spout, and a traveling support for the lower discharging end of the lower sectional part of the distributing-spout.

4. The combination with a distributing-spout for grain, &c., having sectional distributing parts, and the ends of each sectional part bent in opposite directions, of a boxing for each bent portion of the ends of said part, and rotative suspension-joints upon the boxing connecting the ends of the sectional parts of the spout.

FRANCIS E. PARKER.

Witnesses:
FRANCIS A. LEACH,
ALBERT C. STOWELL.

816

454–455

No. 769,126. PATENTED AUG. 30, 1904.

E. L. & A. C. ADAMS.

APPARATUS FOR LOADING GRAIN CARS.

APPLICATION FILED JAN. 23, 1904.

NO MODEL. 2 SHEETS—SHEET 1.

Fig 1

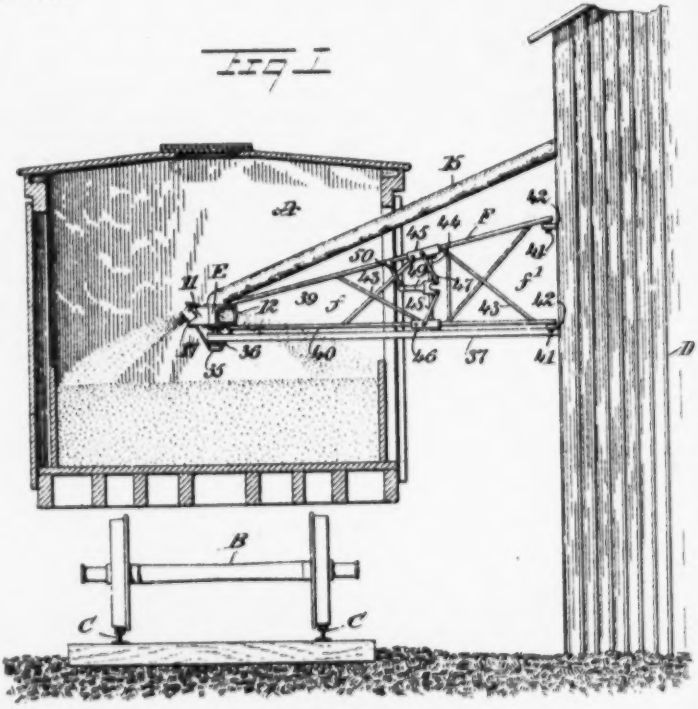
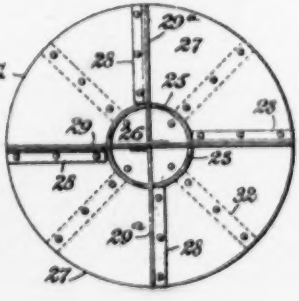


Fig 2



WITNESSES:

H. L. Walker

INVENTORS

Edwin L. Adams

Andy C. Adams

BY Munn & Co

ATTORNEYS

817

456

No. 769,126. PATENTED AUG. 30, 1904.

E. L. & A. C. ADAMS.

APPARATUS FOR LOADING GRAIN CARS.

APPLICATION FILED JAN. 23, 1904.

NO MODEL. 2 SHEETS—SHEET 2.

Fig 3

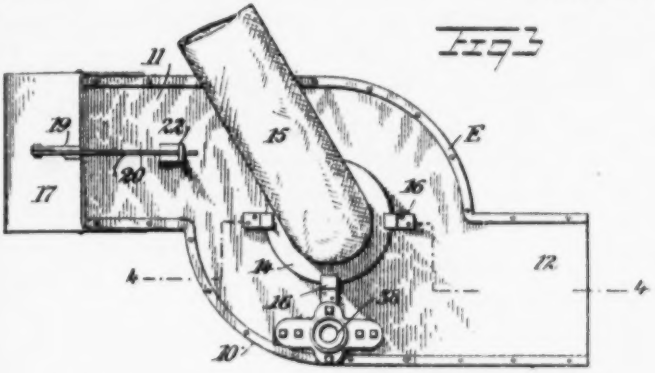


Fig 5

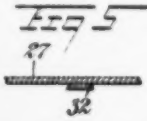


Fig 5

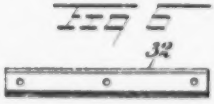


Fig 6

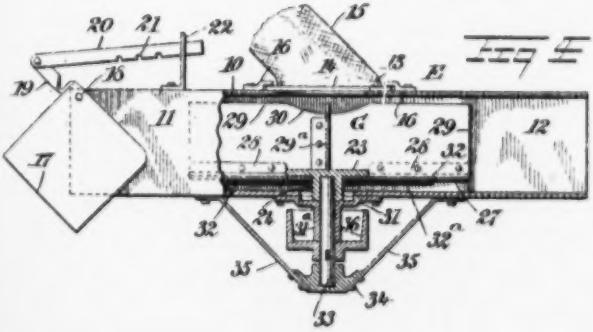


Fig 7



WITNESSES:

H. W. Walker

J. Bissell Adams

INVENTORS

Elwin L. Adams

Andy C. Adams

BY

ATTORNEYS

8:8

457

No. 769,126. Patented August 30, 1904.

UNITED STATES PATENT OFFICE.

EDWIN L. ADAMS AND ANDY C. ADAMS, OF EDGAR, NEBRASKA, ASSIGNORS OF ONE-THIRD TO AUGUST SEOVER, OF EDGAR, NEBRASKA.

APPARATUS FOR LOADING GRAIN-CARS.

SPECIFICATION forming part of Letters Patent No. 769,126, dated August 30, 1904.

Application filed January 23, 1904. Serial No. 190,494. (No model.)

To all whom it may concern:

Be it known that we, EDWIN L. ADAMS and ANDY C. ADAMS, citizens of the United States, and residents of Edgar, in the county of Clay and State of Nebraska, have invented a new and Improved Apparatus for Loading Grain-Cars, of which the following is a full, clear, and exact description.

The purpose of our invention is to provide a simple, durable, and economic form of apparatus especially adapted for loading grain into cars and to so construct the supply-head of the apparatus that the grain can be directed to any desired point in a car, so as to produce an automatic leveling of the grain and obviating the usual manual labor required for such purpose.

A further purpose of the invention is to provide a combined distributing and feed wheel within the supply-head which will act to receive the grain and force the same out in constant streams simultaneously at both ends of the supply-head, the said feed-wheel operating with the least possible amount of friction and so that any grain which may work its way beneath the feed-wheel will be thrown out with the burden of the grain at the delivery ends of the supply-head.

Another purpose of the invention is to provide a pivoted and folding support for the supply-head and a flexible tubular connection between said head and the source of grain-supply, enabling the apparatus to be quickly and conveniently introduced into a grain-car and withdrawn therefrom and likewise enabling the entire apparatus to be compactly folded adjacent to a receptacle containing the bulk of grain when the apparatus is not required for use.

The invention consists in the novel construction and combination of the several parts, as will be hereinafter fully set forth, and pointed out in the claims.

Reference is to be had to the accompanying drawings, forming a part of this specification, in which similar characters of reference indicate corresponding parts in all the figures.

Figure 1 is a transverse section through a grain-car and a side elevation of an apparatus illustrated at work within the car. Fig. 2 is a plan view of the combined feed and distributing wheel. Fig. 3 is an enlarged plan view of the supply-head of the apparatus. Fig. 4 is a sectional side elevation of the supply-head, the section being taken substantially on the line 4 4 of Fig. 3. Fig. 5 is a detail section through a portion of the body of the feed and distributing wheel and a section through a clearance-bar connected therewith. Fig. 6 is a detail plan view of a clearance-bar, and Fig. 7 is a side elevation of the hub of the feed and distributing wheel.

A represents a portion of a grain-car, which may be of any desired type; B, an axle and wheels for the car; C, the tracks for the wheels, located on any suitable bed, and D a receptacle in which the grain is stored.

The apparatus consists mainly of a supply-head E and a support F, the latter being pivoted and constructed in sections to fold one section upon the other. The supply-head E, which is shown in enlarged views in Figs. 3 and 4, consists of a practically circular body-section 10, having outlets 11 and 12 at opposite sides. The shell of the head which has been described is hollow and within the body portion of the head a combined feed and distributing wheel G is mounted to rotate. At the upper central portion of the body 10 of the said supply-head E an opening 13 is made, and around this opening a flange 14 at the lower end of the flexible supply-pipe 15 is closely held on the body of the said supply-head by means of clamps 16, and the opposite end of the supply-pipe 15, as is indicated in Fig. 1, is connected with the source of grain-supply D at a point above the upper edge of the opening in the grain-car through which the said supply-head is introduced. A hood 17 is located at one or at both of the outlets 11 and 12 for the said supply-head E, and, as shown at the left in Fig. 4, the hood when employed is provided with a pivot 18, connecting it with the upper outer side portion of an outlet-section of the said head, and at the upper outer portion of the hood an arm 19 is secured, extending outward and upward from the hood. A link 20 is pivoted to this arm, provided

with notches 21 in its lower edge, adapted to engage with a keeper or rack-bar 22, secured upon the upper face of the said supply-head, so that by adjusting a link 20 the hood 17, connected with this link, may be given any desired inclination, enabling the grain passing through the outlet thus protected to be directed either upward or downward at a greater or a less inclination, as may be found necessary to automatically level the grain in the car.

The combined feed and distributing wheel G is mounted to turn beneath the central portion of the inlet-opening 13 at the top of the supply-head E. In the construction of said combined feed and distributing wheel G a hub 23 is employed, having a sleeve 24 extending downward from its upper portion 26, which is solid and in the form of a disk, and from the marginal portion of the upper portion 26 of the hub teeth 25 extend in an upward direction, each tooth having one straight edge and an opposing concaved edge, as is clearly shown in Fig. 7.

The body of the wheel G consists of a disk or circular plate 27, having an opening therein to fit loosely around the sleeve 24 of the hub 23, so that the said body plate or disk 27 of the wheel extends beneath the top portion 26 of the hub, as is clearly shown in Fig. 4.

At each quarter of the circle of the body-plate 27 of the wheel G a radial angle-iron 28 is secured in any suitable or approved manner. These angle-irons have bolted or otherwise secured thereto upwardly-extending blades 29 and 29*, the blades 29 being at right angles to the blades 29*. In fact, the two blades 29 and 29* intersect centrally at the upper portion of the hub 23. These blades pass between the teeth 25, so that as the hub 23 is revolved the blades 29 and 29* are carried around with the hub, carrying with them the body plate or disk 27. Preferably the blade 29 is in one piece, extending from side to side of the body plate or disk 27; but the blade 29* is usually made in two sections, connected at their inner ends and opposite sides to the central portion of the blade 29, as clearly shown in Fig. 2.

Where the blades 29 and 29* connect, concavities 30 are formed in the upper edges of the blades, as is shown in Fig. 4, to facilitate the distribution of the grain fed to the said wheel through the supply-pipe 15, as the blades 29 and 29* divide the wheel into compartments and grain is received in each of the compartments thus formed. The sleeve 24 of the hub 23 extends downward within a central depression 31 in the bottom of the body 10 of the supply-head E, as is shown in Fig. 4, and from this depression, which is provided with an opening, a sleeve 31* is downwardly carried, the bore of which registers with the opening in the depression 31. A space 32* is preferably formed between the bottom of the supply-head and the under face of the body-plate 27 of the wheel G, as is also shown in Fig. 4, in order that the said wheel may turn with the least possible amount of friction.

As the wheel revolves the grain located in the compartments of the wheel is carried by centrifugal force through the outlets 11 and 12 of the supply-head E in a continuous stream, as is illustrated in Fig. 1; but it may happen that some grain will lodge between the bottom of the wheel G and the bottom 10 of the supply-head E in the space 32* and serve to clog the said wheel. In order to expel any grain thus finding lodgment in the space 32*, clearance-bars 32 are secured to the under face of the body portion 27 of the wheel. The said clearance-bars are usually four in number, being located radially between the opposing members of the blades 29 and 29*, as is shown by dotted lines in Fig. 2.

In Figs. 5 and 6 the clearance-bars are shown more in detail, in which it will be observed that each clearance-bar is dovetail shape in cross-section, being narrowest at the top and widest at the bottom. As the wheel G revolves the fronts of the clearance-bars tend to discharge the air, while their back portions create practically a suction, so that the said clearance-bars will tend to lift the surplus grain, or the grain in the space 32*, and force it to one or the other of the outlets for the supply-head.

A shaft 33 extends up into the sleeve 24 of the hub 23, being attached to the said sleeve 24, and this shaft extends downward through the sleeve 31* of the body of the supply-head, and the lower end of the shaft 33 is mounted to turn in a bearing 34, supported by truss-bars 35 or their equivalents, which bars are attached to the bearing 34 and to the bottom of the supply-head E, as is shown in Figs. 1 and 5. A pulley 36 is secured to the shaft 33, and a suitable driving-belt 37 (shown in Fig. 1) is passed over this pulley and is carried to any suitable source of power.

At one side of the body 10 of the supply-head E sockets 38 are formed at the top and at the bottom of the head. These sockets are adapted to receive the outer ends of the upper members 39 and the lower members 40 of the pivotal support F for the said head, as is illustrated in Fig. 1. This support F is made, preferably, in two sections—an outer section *f* and an inner section *f'*. The inner section at the top and at the bottom is provided with pins 41 or their equivalents, and these pins enter suitable keepers 42, secured to the grain-receptacle D. Each section *f* and *f'* of the support is provided with suitable braces 43. The inner section *f'* of the support is preferably provided with a pivot-shaft 44 at its outer end, and the inner or opposing end of the section *f* of the said support is pivoted to this shaft, so that one section of the support

820

459–461

may fold upon the other and both sections may be folded close to the receptacle D.

In order that the two sections *f* and *f'* may be held rigidly in alinement with each other when the supply-head is in use, shoes or clips 45 and 46, preferably U-shaped in cross-section, are pivoted, for example, to the upper and lower members of the outer section *f*, as is also shown in Fig. 1. When the two sections of the support are to be held rigidly together, these clips 45 and 46 cover the points of connection between the two sections. Links 47 and 48 connect the shoes or clips 45 and 46 with a shifting-bar 49, the connection being at one end of the shifting-bar, and the opposite end of the shifting-bar is connected by links 50 with, for example, the upper portion of the outer section *f* of the support. When the shoes or clips 45 and 46 are in position to hold the sections *f* and *f'* together, the shifting-bar 49, as is shown in Fig. 1, has a thrust in direction of the receptacle D. When it is desired to fold one of the supports upon the other and to remove the supply-head from the car, the shifting-bar 49 is moved in direction of the outer end of the support, which movement will simultaneously carry the clips or shoes 45 and 46 out from their locking engagement with the members of the support.

Having thus described our invention, we claim as new and desire to secure by Letters Patent—

1. In an apparatus for loading grain-cars, a body-casing having outlets at opposite sides, adjustable hoods for the said outlets, a supply-pipe leading into the upper portion of the body-casing, a wheel provided with a disk-body mounted to revolve around the hub of the wheel, the said wheel being mounted to revolve in the body adjacent to the outlets, said wheel being also provided with upwardly-extending plates at angles to each other, dividing the said wheel into a number of compartments, open at the top to receive material from the supply-pipe, clearance-bars secured to the under face of the disk-body of the wheel, and a driving mechanism for the said wheel, as described.

2. In an apparatus for loading grain-cars, a body-casing having outlets at opposite sides, a supply-pipe leading into the body-casing at its center, a wheel mounted to revolve in the said body-casing beneath the supply-tube and adjacent to the outlets, the said wheel consisting of a hub, a disk-body mounted to revolve around the hub, teeth extending upward from the hub, blades extending upward from the body-disk of the wheel, passing across the toothed portion of the hub, and a driving mechanism for the said hub, which hub as it revolves imparts motion to the body-disk through the medium of the said blades, as specified.

3. In an apparatus for loading grain-cars, a body-casing having outlets at opposite sides, a supply-pipe leading into the body-casing at its center, a wheel mounted to revolve in said body-casing beneath the supply-pipe and adjacent to the outlets, the said wheel consisting of a hub, a disk-body mounted to revolve around the hub, teeth extending upward from the hub, blades extending upward from the body-disk of the wheel, passing across the toothed portion of the hub, a driving mechanism for the said hub, which hub as it revolves imparts movement to the body-disk through the medium of the said blades, hoods adjustably located at the outlets for the body-casing, and clearance-bars secured to the under face of the body-disk of the wheel, for the purpose described.

4. In an apparatus for loading grain-cars, a body-casing, a support for the same, the body-casing being provided with outlets at opposite sides, a supply-pipe connected with the said body-casing at its upper portion, a wheel mounted to revolve in the body-casing below the supply-pipe and in close proximity to the outlets, the said wheel comprising a disk-body, means for revolving the said body, upwardly-extending blades crossing the disk-body, being located at angles to each other, and clearance-bars dovetail shape in cross-section, secured to the bottom portion of the body, for the purpose described.

5. In an apparatus for loading grain-cars, a body-casing having an outlet, a supply-pipe leading into the body-casing, a combined feed and distributing wheel mounted to revolve in the body-casing beneath the supply-pipe and adjacent to the said outlet, the said wheel being provided with a series of open partitions and the said supply-pipe being of a flexible material, and a support pivotally connected with said body-casing, which support is constructed in pivotally-connected sections, locking devices for the said sections, and a shifting device for the locking devices, as described.

6. In an apparatus for loading grain-cars, a support for said apparatus, comprising two pivotally-connected sections, one adapted for pivotal attachment to a fixed support and the other being adapted for pivotal attachment to the apparatus, the two sections being pivotally connected, shoes adapted to embrace the sections at their points of pivotal connection, a shifting device for the said shoes, and link connections between the shifting device and the shoes, the links being at angles to one another when the shoes are in locking position, as described.

In testimony whereof we have signed our names to this specification in the presence of two subscribing witnesses.

EDWIN L. ADAMS.
ANDY C. ADAMS.

Witnesses:
W. R. WARD,
J. W. JONES.

821

462-463

No. 830,385. PATENTED SEPT. 4, 1906.

S. T. WALLACE.

HOIST.

APPLICATION FILED DEC. 23, 1905.

2 SHEETS—SHEET 1.

Fig. 1.

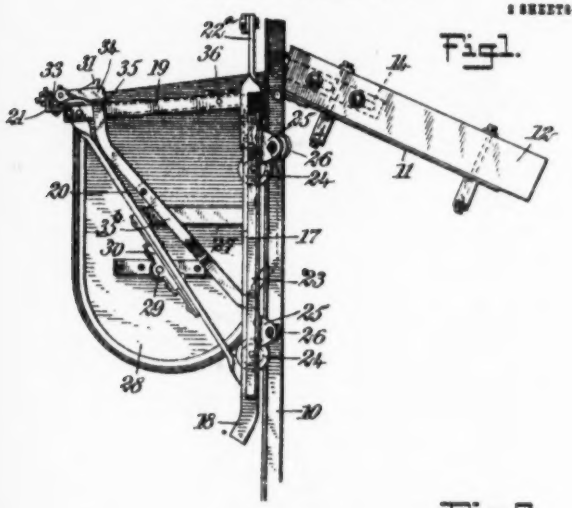
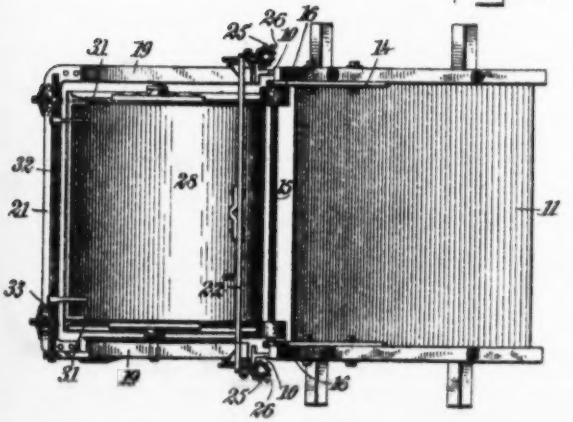


Fig. 2.



WITNESSES:

[signature]

[signature]

INVENTOR

Samuel T. Wallace

BY [signature]

ATTORNEYS

892

464

No. 830,385. PATENTED SEPT. 4, 1906.

S. T. WALLACE.

HOIST.

APPLICATION FILED DEC. 23, 1905.

2 SHEETS—SHEET 1.

Fig. 3.

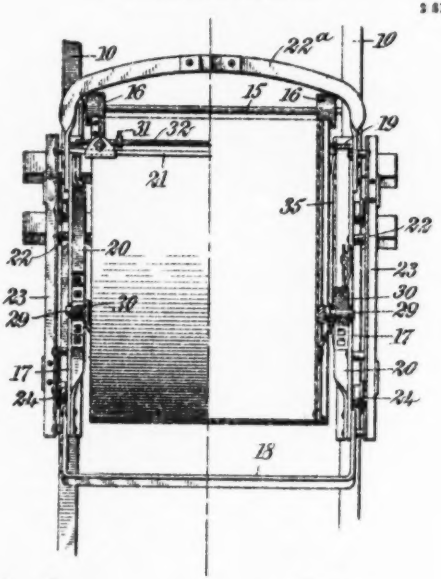


Fig. 4.

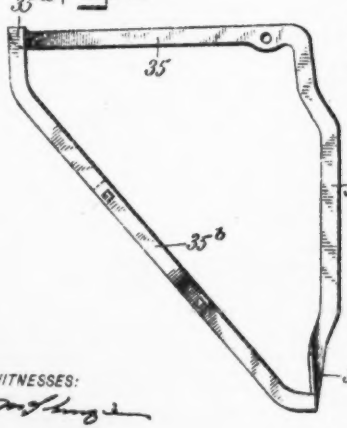


Fig. 5.



Fig. 6.



WITNESSES:

Isaac R. Owens

INVENTOR

Samuel T. Wallace

BY Munn & Co.

ATTORNEYS

UNITED STATES PATENT OFFICE.

SAMUEL THOMAS WALLACE, OF LOS ANGELES, CALIFORNIA.

HOIST.

No. 830,385. Specification of Letters Patent. Patented Sept. 4, 1906.

Application filed December 23, 1905. Serial No. 293,089.

To all whom it may concern:

Be it known that I, SAMUEL THOMAS WALLACE, a citizen of the United States, and a resident of Los Angeles, in the county of Los Angeles and State of California, have invented a new and Improved Hoist, of which the following is a full, clear, and exact description.

The invention relates to an improvement in the hoist forming the subject-matter of my prior patent, Serial No. 771,108, dated September 27, 1904.

The object of my present invention is primarily to adapt it to handling mortar, lime, cement, brick, and other material required to be carried in a hopper or bucket. In attaining this end I provide a carriage which is adapted to move along a vertical track and which mounts pivotally a bucket. Coacting with the bucket is a peculiar latch and trip, by means of which the bucket is held during the ascent and automatically released when the top of the track is reached, the bucket being pivoted off center, so that as the bucket is released the bucket automatically tilts and dumps its load.

The invention resides in certain special features, which will be fully set forth hereinafter, and particularly pointed out in the claims.

Reference is to be had to the accompanying drawings, which illustrate as an example the preferred embodiment of my invention, in which drawings—

Figure 1 is a side elevation of the invention, showing a bucket approaching the upper end of the track. Fig. 2 is a plan view of the parts shown in Fig. 1. Fig. 3 is a front elevation of the apparatus with a part in section. Fig. 4 is a side view of the trip. Fig. 5 is a front view thereof, and Fig. 6 is a detail of one of the latches.

As may be seen from my prior patent, the invention is intended for hoisting the material—for instance, for raising materials in a building in the course of construction.

10 indicates the vertically-extending stationary track, which is formed of two T-rails suitably braced. Near the upper end of the track is located a chute 11, which is sustained by a frame 12 and which is adapted to receive the load and direct the same into the building. In Fig. 1 the track is broken away at a point directly above the frame 12, but in practice the track will extend a relatively greater distance above the chute—for example, approximately four feet. Carried by the frame 12 are adjustable bearings 14, which sustain a horizontal shaft 15, carrying trip-rollers 16, the operation of which will be hereinafter fully set forth.

Adapted to move on the vertical track 10 is a carriage which, as shown in Figs. 1, 2, and 3, comprises vertical side beams 17, to the lower ends of which is fastened a transversely-extending bottom brace 18. Said side beams 17 extend upwardly and are thence bent outward horizontally to form top frames 19. Said frames 19 are fastened to diagonal braces 20, (best shown in Fig. 1,) which extend downward and are fastened to the lower ends of the side frames 17. The outer ends of the top frames 19 are also connected by a cross-brace 21, riveted in place.

22ª indicates a bail, the ends of which are riveted or otherwise fastened to the side frames 18. Connected by stay-bolts 22 to the side frames 17 are bars 23, which extend vertically on each side of the carriage and are constructed preferably of angle-iron, as shown. Located between the bars 23 and the side frames 17 are rollers 24, which run on the track 10, the journals of said rollers being held in the parts 17 and 23, said rollers being arranged two at each side of the carriage. Attached to each bar 23 are two brackets 25, which are diagonally disposed, as shown best in Fig. 2, and carry beveled and flanged rollers 26. These rollers engage the rear sides of the rails 10, so that the carriage is securely held on the track and prevented from any movement independently thereof, except a vertical movement along the track. A suitable connection is joined to the bail 22ª to permit elevating the carriage. The braces 20 are further strengthened by means of struts 27, which extend from the braces inward to the respective side frames 17 and are fastened to said parts. The bucket 28 may be of any desired construction and is here shown with a rounding bottom and an open upper end. The bucket has studs 29, fastened to each side at a point outward from the vertical center of the bucket, and these studs or trunnions are mounted in bearings 30, attached, respectively, to the braces 20, so that the bucket is free to turn around the center of the trunnions into dumping position. Since said trunnions are located outward from said center of the bucket, the weight of the bucket and its load will cause the bucket to auto-

matically tilt as soon as the devices for holding the bucket, which will be hereinafter described, are released. Said bucket is held releasably in upright or normal position by means of two latches 31, which are fastened on a rock-shaft 32, held in bearings 33, and these bearings are in turn sustained by the front brace 21, before described. Fastened to one end of the rock-shaft 32 is an arm 33, and this is adapted to be struck by the trip or trigger 35, which is shown best in Figs. 4 and 5. Said trip is located at the side of the bucket in which the arm 34 is located, and the trip is pivoted to the adjacent top frame 19 by means of a pin 36. (See Fig. 1.) The trip is triangular in general form, its upper run lying just inward of the top frame 19, as shown by the dotted lines in Fig. 1, and thence bending laterally, as indicated at 35^a, so as to pass outside of the top frame. The trip then extends downward and inward, and the diagonal run of the trip has a loop 35^b formed therein, which loosely receives the adjacent strut 27. The lower end of said diagonal run is joined by a twist 35^c to the vertical run, and this vertical run is formed with an offset portion 35^d, which is adapted to strike the trip-roller 16, so as to operate the trip when the carriage reaches its elevated position. Normally the trip hangs by gravity in inactive position, (shown by Fig. 1,) the bend 35^a of the trip lying under the arm 34, so that when this part of the trip is thrown up the shaft 32 will be rocked, so as to lift the dogs 31 and release the bucket.

In the operation of the invention the parts are assembled as shown in the drawings, and the carriage with the loaded bucket is raised along the track 10. The parts are so arranged that when the bucket reaches a point level with the chute 11, so that the load of the bucket may be properly dumped in the chute, the offset portion 35^d of the trip will run into engagement with the adjacent trip-roller 16. This will throw the trip outward and raise the bend 35^a, thus rocking the shaft 32 and disengaging the dogs 31. The bucket then tilts by gravity forward and empties its load on the chute 11. When the bucket has been emptied, the carriage should be allowed to descend, the rollers 16 then engaging the bucket and throwing it back to the upright position shown. As this operation takes place the front edge of the bucket strikes the dogs 31 and passes under them, allowing the dogs to fall and retaining the bucket in place until the trip is again actuated to release the dogs.

Having thus described the preferred form of my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. The combination of a vertical track, a carriage arranged to move thereon, a dumping-bucket mounted on the carriage, a dog adapted to hold the bucket in active position, a trip arranged to release the dog, whereby to dump the bucket and means for automatically operating the trip.

2. The combination of a vertically-extending track, a carriage adapted to move thereon, a dumping-bucket mounted on the carriage, a dog for retaining the bucket in active position, a chute at the upper portion of the track, and means for automatically releasing the dog whereby to dump the bucket to throw the contents thereof on the chute.

3. The combination of a vertically-extending track, a chute at the upper portion thereof, a carriage arranged to move on the track, a dumping-bucket mounted on the carriage, a latch adapted to releasably hold the carriage in active position, a trip arranged to release the latch, and means adjacent to the chute for actuating the trip.

4. The combination of a track, a carriage arranged to move thereon, a dumping-bucket mounted on the carriage, a dog adapted to releasably hold the bucket, a trip pivotally mounted on the carriage and adapted to actuate the dog, and a stationary trip-operating member located alongside of the track to be engaged by the trip.

5. The combination of a track, a carriage arranged to move thereon, a dumping-bucket mounted on the carriage, a dog adapted to retain the bucket in active position, a triangular trip pivotally mounted on the carriage and adapted to actuate the dog, said trip having an offset portion, and a stationary operating member adapted to be engaged by said offset portion of the trip.

6. The combination of a track, a carriage arranged to run thereon, a dumping-bucket mounted on the carriage, a rock-shaft mounted on the carriage, a dog attached to the rock-shaft and releasably engaging the bucket, an arm also engaging the rock-shaft, a trip mounted on the carriage and engaging the arm, and means for automatically operating the trip.

7. The combination of a track, a carriage arranged to run on the same, a bucket pivotally mounted on the carriage at a point to one side of the vertical center of the bucket, whereby to cause the bucket to tilt, a latch adapted to retain the bucket in upright position, and means for automatically operating the latch.

8. The combination of a frame, a carriage adapted to run thereon, the carriage having side frames, outwardly-extendi ngtop frames, and diagonally-extending braces connecting the outer ends of the top frames with the lower ends of the side frames, bearings carried by said braces, a bucket pivotally mounted in said bearings, and a releasable means for retaining the bucket in upright position.

9. The combination of a track, a carriage having side frames, and side bars located

outwardly and spaced from the side frames, rollers mounted on the carriage between said side frames and bars and engaging the track, brackets attached to the side bars, rollers carried by the brackets and adapted to engage the back of the track, and a bucket mounted on the carriage.

10. The combination of the vertical track, a chute projecting outwardly from the upper portion thereof, a carriage arranged to run on the track, a bucket pivoted below its horizontal center to the carriage, means for retaining the bucket in an upright position, and means for automatically releasing the retaining means whereby to dump the bucket, when said bucket reaches a position opposite the chute.

11. The combination of a vertical track, a chute located near the upper end thereof, a carriage adapted to run on the track, a bucket pivotally mounted on the carriage at a point to one side of the vertical center of the bucket, for the purpose specified, means for releasably holding the bucket in upright position, and devices for automatically releasing said means as the bucket reaches a position opposite the chute.

12. The combination of a track, a carriage arranged to run thereon, a dumping-bucket mounted on the carriage, a latch adapted to hold the bucket in upright position, a trip pivotally mounted on the carriage, the trip having a loop therein adapted loosely to receive a part of the framing of the carriage, said trip being adapted to operate said latch, and means for automatically actuating the trip.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

SAMUEL THOMAS WALLACE.

Witnesses:

E. B. LINDESMITH,

C. E. GILHOUSEN.

826

470-471

No. 862,874.

PATENTED AUG. 13, 1907.

J. BEACH.

PORTABLE ELEVATOR.

APPLICATION FILED AUG. 1, 1906.

2 SHEETS—SHEET 1.

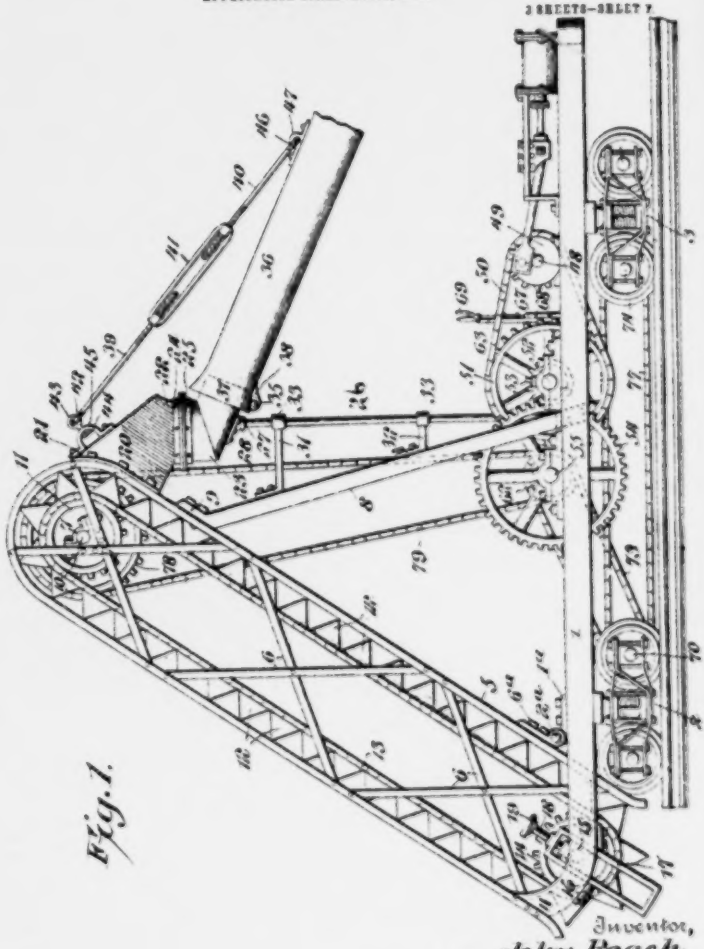


Fig. 1.

Witnesses

Howard D. Orr

J. H. Peley

Inventor,

John Beach,

By E. L. Siggers

Attorney

472-473

No. 862,874. PATENTED AUG. 13, 1907.

J. BEACH.

PORTABLE ELEVATOR.

APPLICATION FILED AUG. 1, 1906.

3 SHEETS—SHEET 2.

Fig. 6.

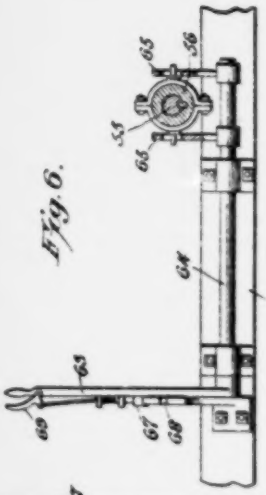


Fig. 7.



Fig. 8.

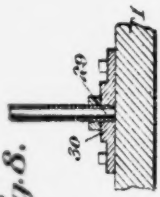
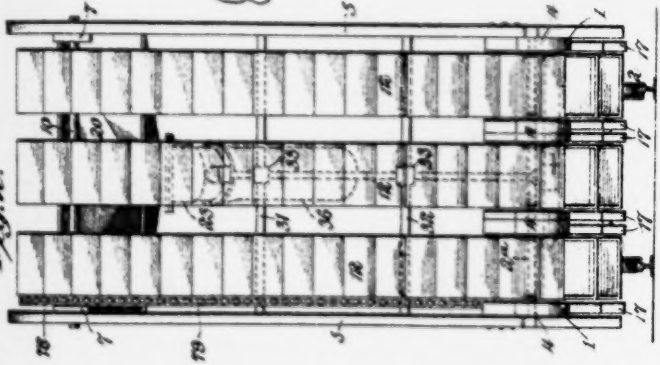


Fig. 2.



Witnesses
Howard D. Orr
H. F. Riley

Inventor,
John Beach,
By E. G. Siggers
Attorney

828

474

No. 862,874. PATENTED AUG. 13, 1907.

J. BEACH.

PORTABLE ELEVATOR.

APPLICATION FILED AUG. 1, 1906.

2 SHEETS—SHEET 2

Fig. 3.

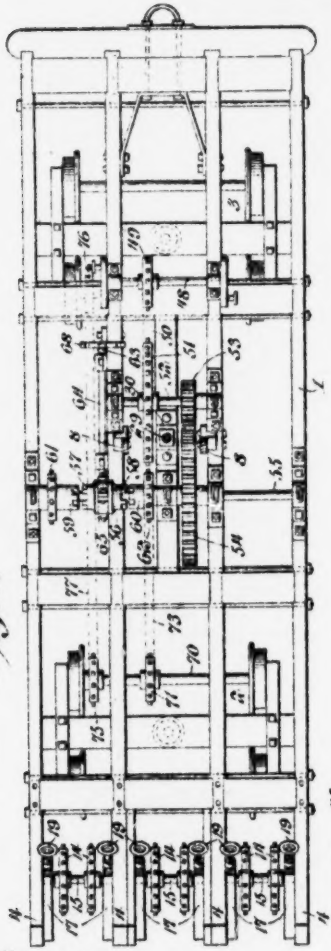


Fig. 5.

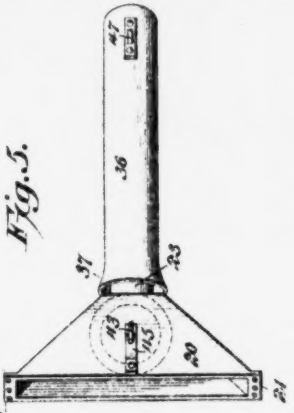
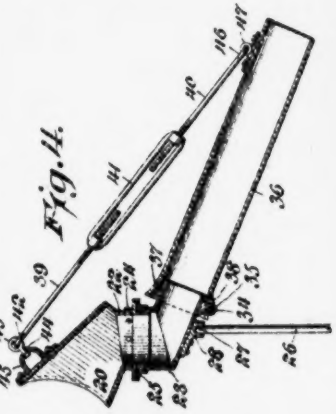


Fig. 4.



Witnesses
Howard D. Orr.
H. J. Riley

Inventor,
John Beach,
By E. G. Siggers
Attorney

UNITED STATES PATENT OFFICE.

JOHN BEACH, OF HARWOOD MINES, PENNSYLVANIA.

PORTABLE ELEVATOR.

No. 862,874. Specification of Letters Patent. Patented Aug. 13, 1907.

Application filed August 1, 1906. Serial No. 328,796.

To all whom it may concern:

Be it known that I, JOHN BEACH, a citizen of the United States, residing at Harwood Mines, in the county of Luzerne and State of Pennsylvania, have invented a new and useful Portable Elevator, of which the following is a specification.

The invention relates to improvements in portable or traveling elevators.

The object of the present invention is to improve the construction of traveling or portable elevators, and to provide a simple and comparatively inexpensive elevator designed for handling various loose materials in bulk, and adapted to rapidly elevate the same from a bank or pile for loading cars or wagons, or for delivering the material to a conveyer line, or other place.

A further object of the invention is to provide an elevator of this character, having means for either moving it backward or forward to advance it into the material to be elevated, or for operating a plurality of endless conveyers for carrying the material upward.

Another object of the invention is an adjustable spout or chute, which will be capable of a vertical swinging movement and a horizontal rotary movement for discharging material in the desired direction, and at the desired elevation.

Furthermore the invention has for its object to provide a portable elevator adapted to deliver the material into a car either at the front, center or side thereof, and capable, when delivering the material into a car at the rear end thereof, of enabling the track, on which the elevator travels, to be used by the cars to be loaded.

With these and other objects in view, the invention consists in the construction and novel combination of parts hereinafter fully described, illustrated in the accompanying drawings, and pointed out in the claims hereto appended, it being understood that various changes in the form, proportion, size and minor details of construction, within the scope of the claims, may be resorted to without departing from the spirit or sacrificing any of the advantages of the invention.

In the drawings:—Figure 1 is a side elevation of a portable or traveling elevator, constructed in accordance with this invention. Fig. 2 is a front elevation. Fig. 3 is a plan view of the car, partly in section. Figs. 4 and 5 are detail views, illustrating the construction of the adjustable discharge spout or chute. Fig. 6 is a detail view, illustrating the arrangement of the clutch operating member. Figs. 7 and 8 are detail perspective views, illustrating the manner of mounting the vertical pivot of the elbow of the chute.

Like numerals of reference designate corresponding parts in all the figures of the drawings.

1 designates a main or car frame, composed of intermediate and side longitudinal beams and transverse connecting bars or beams, and mounted upon front and rear car trucks 2 and 3, which may be of any desired construction, and which may be provided with any desired number of axles and wheels, although in the accompanying drawings four-wheeled trucks are illustrated. In practice the front truck 2 is spaced a sufficient distance from the front end of the machine to enable sections of track to be laid in front of the machine for advancing the latter as the material is elevated. The longitudinal beams of the main or car frame are curved upwardly at their front ends 4, and an upwardly and inwardly inclined conveyer frame 5 is mounted on the front end of the main or car frame.

The conveyer frame, which may be of any desired construction, is provided at opposite sides with crossed inclined braces 6, and is rigidly secured at its lower end to the main or car frame, when it is in operative position, and in order to enable it to be lowered and folded for transportation, it is detachably secured by bolts, or other suitable fastening devices to the upwardly curved ends 4 of the beams of the main frame, and it is hingedly connected at its inner or rear side. The conveyer frame is provided at opposite sides of the main frame and also at opposite sides of the center thereof with brackets or plates 6^a, provided with eyes, which register with eyes of corresponding brackets or plates 1^a of the main or car frame. The eyes of the brackets or plates 1^a and 6^a receive a continuous pintle rod 2^a, which extends entirely across the machine. The hinged connection between the conveyer frame and the main or car frame permits the conveyer frame to swing downward upon the main or car frame, when the bolts or other fastening devices of its front or outer portion are removed, and when the braces 8 and the adjustable swinging chute and its supporting pivot, hereinafter described, are detached. The short lower shafts and the sprocket wheels thereof are also removed when the conveyer frame is to be lowered upon the main or car frame. The conveyer frame is adapted to be lowered upon the machinery hereinafter described, which does not have to be detached. The conveyer frame, which is provided at the top portion with opposite bearings 7, is also supported by inclined bracing bars or members 8, secured at their lower ends to the main or car frame at opposite sides thereof by bolts, or other suitable fastening devices and inclined upwardly and forwardly and provided at their upper terminals with angularly disposed portions 9, which fit against the adjacent inclined portions of the conveyer frame and are suitably secured to the same. By this construction the conveyer frame is rigidly supported in an inclined position over the car. The conveyer frame may be constructed of any desired height to adapt the machine for the character of work to be performed.

The bearings 7 receive an upper shaft 10, which extends entirely across the conveyer frame and which receives upper sprocket wheels 11 of a plurality of endless conveyers. The endless conveyers, which may be of any desired number, are located at opposite sides of the top and at the center of the space between the rails. The side conveyers are located above the rails and project beyond the same. In the accompanying drawings three are shown, one being located at the center of the front end of the car, and the other two being arranged at opposite sides of the central conveyer. The conveyers are provided with approximately triangular buckets 12, suitably secured to endless sprocket chains 13, which are arranged in pairs and which extend downwardly and forwardly from the upper sprocket wheels 11 to lower sprocket wheels 14. Each endless conveyer is provided at its lower end with an independent or separate shaft 15, journaled in adjustable bearings 16 to enable the slack in the chain of any one of the conveyers to be readily taken up. The adjustable bearings 16 are slidable in oblong frames or pedestals 17, which are arranged at an inclination and which extend a sufficient distance below the front of the main or car frame to enable the endless conveyers, when operating on a loose bank of material, to clear a space in advance of the front truck, of sufficient depth to receive the cross-ties and rails for extending the track in advance of the machine.

In practice the track will be laid in four or five foot sections, and there will be sufficient space between the front wheels and the elevators to permit a section of track to be placed in position for extending the track already laid. The central conveyer, which is arranged between the rails, and the side conveyers, which project laterally beyond the rails, are adapted to not only load the material upon the car, but they also clear a space sufficiently large for the machine to follow up its work without hand shifting.

When moving the machine from one place to another, the bottom buckets may be taken off. The bearings 16 are adjusted by means of screws 18, arranged at the upper ends of the guides and provided at their upper ends with hand wheels 19, or other suitable means for rotating them.

The lower portions of the endless conveyers extend downward from the front end of the car, and are adapted to engage any loose material in bulk, such as stored coal, loose earth, or the like, and the buckets are adapted to carry the material upwardly to an adjustable spout or chute. The buckets, in traveling over the upper end of the conveyer frame, are inverted to discharge their contents into a hopper shaped upper section 20 of the spout or chute.

The hopper shaped upper section 20, which tapers downwardly, is set at an inclination and is secured at its upper end to the conveyer frame. The upper end of the section 20 is provided with opposite laterally extending attachment flanges 21, which are bolted to the adjacent portions of the conveyer frame. The lower end of the upper section 20 is provided with a depending cylindrical neck 22, which fits in a rotary elbow 23, having a vertical upper portion and an inclined lower portion. The upper vertical portion receives the depending neck 22 of the hopper-shaped section 20, and the neck and elbow are provided with collars 24 and 25, arranged exteriorly of the said parts and provided with horizontal annular flanges, which fit against each other, whereby the elbow is capable of free rotary movement on the neck.

The elbow is supported by a vertical pivot, which has a round upper end 27 to fit in a depending socket 28 of the elbow. The depending socket 28, which is arranged vertically, as clearly illustrated in Fig. 4 of the drawings, is provided with an inclined attachment plate or portion, which is bolted or otherwise secured to the elbow. The upper end 27 is solid, but the rest of the vertical pivot 26 is preferably tubular, and is provided with a threaded lower end 29, which is screwed into a threaded socket 30 of the car frame. The threaded socket may be mounted on the car frame in any desired manner, and the vertical pivot is supported at an intermediate point by braces 31 and 32, having diverging arms or portions, which are secured to the inclined bars or members 8. The braces 31 and 32 are provided at their apexes with eyes 33 through which the vertical pivot passes.

The lower inclined portion of the elbow is provided with a depending eye 34, which receives a pivot or pintle 39, and the latter hinges a lower adjustable section 36 to the elbow. The lower adjustable section 36 of the spout or chute is arranged at an inclination and is provided with a flared upper end 37 to receive the lower end of the elbow, and it is provided at the bottom of the flared portion with a slot to receive the projecting eye 34, and it has eyes 38 at opposite sides of the slot for the reception of the pivot or pintle. The lower inclined section 36 of the spout is adapted to swing upwardly and downwardly, and is adjustably supported by means of a brace, composed of upper and lower rods 39 and 40 and a connecting turn buckle 41. The upper rod 39 is provided at its upper end with an eye 42, which is linked into a swiveled eye 43, whereby the brace is adapted to swing freely, when the elbow and the lower section 36 are moved horizontally. The swiveled eye 43 is provided with a pivot 44, which is arranged in a perforation or bearing opening of a substantially U-shaped bracket or member 45. The substantially U-shaped bracket or member 45 is mounted on the upper hopper shaped section 20 of the spout or chute, and it has terminal projecting portions secured to the same. The lower end of the lower rod 40 is provided with an eye 46, which is linked into an eye 47 of the bottom section 36 of the spout or chute. The inclined lower section is adapted to swing horizontally to extend it in any direction, and it is also adapted to be readily raised and lowered by means of the adjustable brace 41. The lower section 36 may be made of any desired length, and the conveyer is adapted to deliver the material into a car at the center or either end thereof, and when filling a car at the rear end thereof, the track on which the machine travels may be utilized for running the cars to be filled to and from the machine.

The machine may be propelled forwardly or backwardly and the conveyers operated by any suitable motor, which is designed to be coupled to a transverse crank shaft 48, and the latter carries a sprocket pinion 49, which is connected by a sprocket chain 50 with a large sprocket wheel 51 of a counter-shaft 52. The gears may be of any relative size to secure the desired power and speed. The counter-shaft 52 is provided with

a spur pinion 53, which meshes with a large spur gear 54 of a main transverse shaft 55, from which motion is communicated either to the car or to the endless conveyers.

Mounted on the transverse shaft is a slidable clutch section 56, having opposite clutch faces 57 and 58, which are adapted to engage corresponding clutch sections 59 and 60 of the sprocket pinions or gears 61 and 62. The movable clutch section 56 is slidably interlocked with the shaft, and it may be engaged with either of the clutch sections 59 and 60, or may be arranged at an intermediate point, as illustrated in Fig. 3 of the drawings. The clutch sections, as clearly illustrated in Fig. 3 of the drawings, are provided with projections and recesses to enable the sections to interlock when engaged with each other, but any other form of clutch may be employed, if desired. The clutch is operated by means of a shifting lever 63, mounted on a longitudinal rock shaft 64, which is provided at its front end with a pair of upwardly extending arms 65, located at opposite sides of the slidable clutch section, as clearly shown in Fig. 6 of the drawings. The shifting lever 63 carries a spring actuated detent or dog 67, arranged to engage a notched segment 68, and adapted to be operated by a latch lever 69, mounted on the shifting lever adjacent to the upper end thereof. The notched segment 68, which is suitably fixed to the main or car frame, is provided with central and side notches, for holding the slidable clutch section in engagement with either of the other clutch sections, or for maintaining the slidable clutch sections out of engagement with both of the other clutch sections, as clearly shown in Fig. 3 of the drawings, whereby the motor may operate without actuating either the car or the conveyers.

The main transverse shaft is connected with the rear axle 70 of the front truck by means of sprocket gearing, consisting of sprocket wheels 71 and 62, mounted respectively on the axle 70 and on the main transverse shaft and receiving a sprocket chain 73. The front axle 74 of the rear truck is positively driven by a sprocket gearing connecting the front axle of the rear truck to the rear axle of the front truck, and consisting of sprocket wheels 75 and 76, and a sprocket chain 77.

The main transverse shaft is connected with the upper shaft of the series of the endless conveyers by means of sprocket gearing, consisting of an upper sprocket wheel 78, the lower sprocket gear 61 and a sprocket chain 79. This gearing is located at one side of the machine, as clearly illustrated in Fig. 2 of the drawings, and is set in motion when the slidable clutch section is in engagement with the clutch section 59 of the sprocket gear 61.

Having thus fully described my invention, what I claim as new and desire to secure by Letters Patent, is:—

1. A machine of the class described comprising a wheeled frame, an inclined conveyer frame rigidly mounted on the conveyer frame at one end thereof and extending upwardly and inwardly, a plurality of endless conveyers, a continuous shaft mounted on the conveyer frame at the upper portion thereof and receiving the said conveyers, and separate independently adjustable lower shafts mounted on the conveyer frame and receiving the said conveyers.

2. A machine of the class described comprising a main frame, a conveyer frame mounted on the main frame, a continuous shaft journaled on the conveyer frame at one end thereof, separate independently adjustable shafts journaled on the conveyer frame at the opposite end thereof, and a plurality of endless conveyers mounted on the said shafts.

3. In a machine of the class described, the combination with a track, of a wheeled frame adapted to run on the track, a plurality of endless conveyers consisting of a central conveyer located in the space between the rails of the track, and side conveyers operating above the rails, and means for operating the conveyers.

4. In a machine of the class described, the combination with a track of a wheeled frame designed to run on the track, a plurality of endless conveyers, the side conveyers of which are arranged to operate above the rails of the track, and means for operating the conveyers.

5. A machine of the class described comprising an inclined conveyer frame, a plurality of conveyers, an inclined downwardly tapered chute fixed at the top to the conveyer frame and having a neck at the bottom, a rotary elbow connected with the neck, and an adjustable section hinged to the elbow and arranged to swing vertically.

6. A machine of the class described comprising a conveyer, a chute fixed to the conveyer, a rotary section connected with the chute, an adjustable section pivoted to the rotary section and arranged to swing vertically, and an adjustable brace located above the adjustable section and connected with the same and with the chute.

7. A machine of the class described comprising a main frame, a conveyer having an inclined conveyer frame, braces mounted on the main frame and connected with the conveyer frame, a chute having an adjustable section arranged to rotate horizontally, a vertical pivot mounted on the main frame and supporting the adjustable section of the chute, and braces secured to the said braces and provided with eyes receiving the vertical pivot.

8. A machine of the class described comprising a conveyer, a chute having a fixed section and provided with an adjustable section arranged to swing vertically and horizontally, an adjustable brace connected with the adjustable section and provided with a pivot, and a bracket mounted on the fixed section and receiving a pivot of the adjustable brace.

9. A machine of the class described comprising a conveyer, a chute having a fixed section and provided with an adjustable section arranged to swing vertically and horizontally, an arched bracket mounted on the fixed section and projecting therefrom, and a brace connected with the adjustable section and having a pivot mounted on the arched bracket.

10. A machine of the class described comprising a conveyer having a frame, a chute composed of a hopper shaped section secured to the conveyer frame and having a neck, a pivotally mounted elbow connected with the neck, a bottom section hinged to the elbow, and adjustable means secured to the bottom section and pivotally connected with the hopper shaped section.

11. In a machine of the class described, the combination with a track, of a wheeled frame adapted to run on the track, a plurality of endless conveyers consisting of a central conveyer located in the space between the rails of the track, and side conveyers operating above the rails and extending laterally beyond the same, and means for operating the conveyers.

12. In a machine of the class described, the combination of a frame, car trucks supporting the frame and provided with wheels constructed to run on a track, a plurality of endless conveyers carried by the frame and consisting of a central conveyer located in advance of the space between the wheels of the trucks, and side conveyers operating in advance of the said wheels, and means for operating the conveyer.

In testimony that I claim the foregoing as my own, I have hereto affixed my signature in the presence of two witnesses.

JOHN BEACH.

Witnesses:
CHAS. H. CRELLIN,
GEORGE F. BURKHARDT.

882

480–481

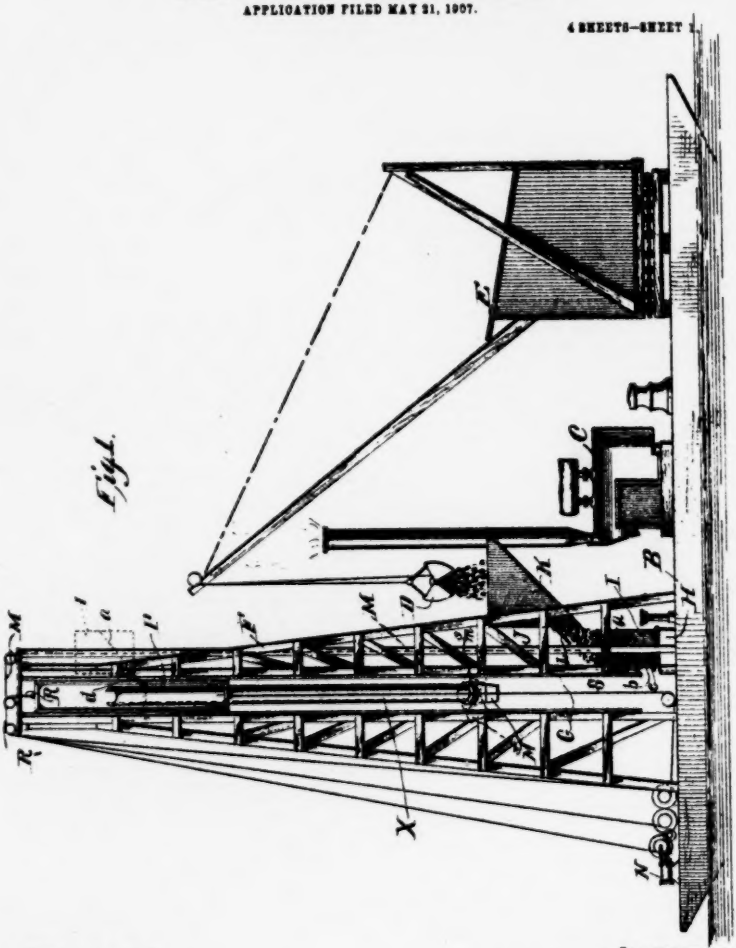
No. 866,166. PATENTED SEPT. 17, 1907.

G. W. THEISS, R. J. W. WHANN & W. J. ENGLISBEE.

LOADING AND UNLOADING APPARATUS.

APPLICATION FILED MAY 21, 1907.

4 SHEETS—SHEET 1.



WITNESSES:
D. C. Wilson.
J. J. Sheehy Jr.

INVENTORS
George W. Theiss.
Robert J. W. Whann &
William J. Englisbee.
BY James J. Sheehy Attorney

482-483

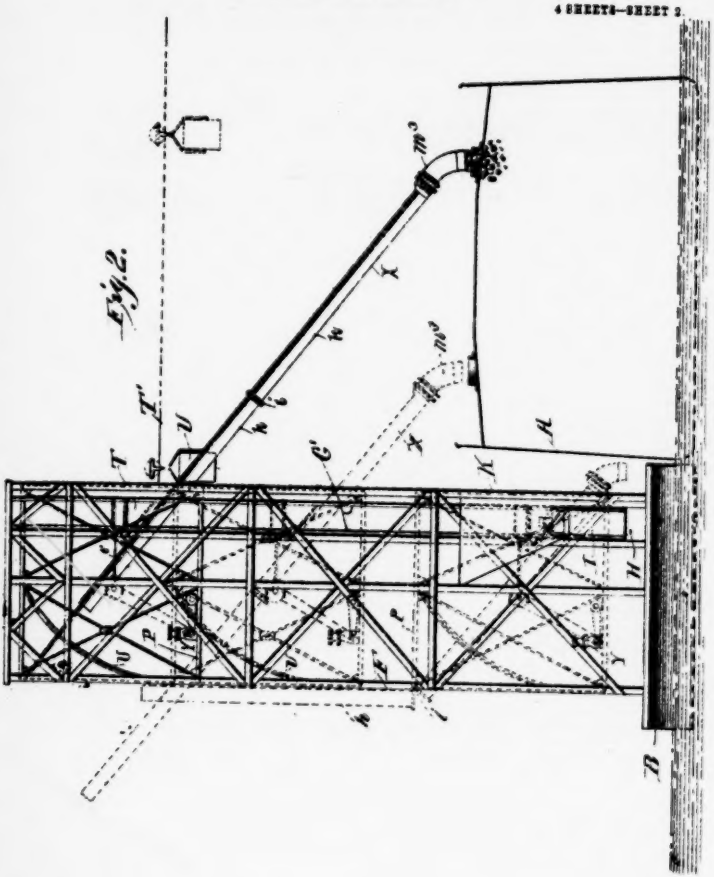
No. 866,166. PATENTED SEPT. 17, 1907.

G. W. THEISS, R. J. W. WHANN & W. J. ENGLISBEE.

LOADING AND UNLOADING APPARATUS.

APPLICATION FILED MAY 21, 1907.

4 SHEETS—SHEET 2.



WITNESSES:

INVENTORS

George W. Theiss
Robert J. W. Whann
William J. Englisbee

By James L. Shelby Attorney

834

484–485

No. 866,166. PATENTED SEPT. 17, 1907.

G. W. THEISS, R. J. W. WHANN & W. J. ENGLISBEE.

LOADING AND UNLOADING APPARATUS.

APPLICATION FILED MAY 31, 1907.

4 SHEETS—SHEET 3.

Fig. 4.

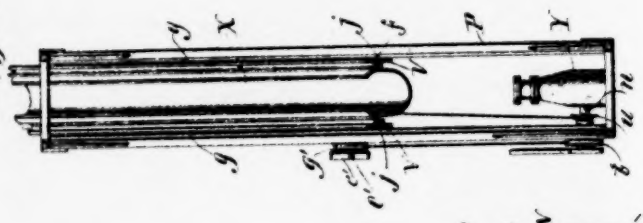
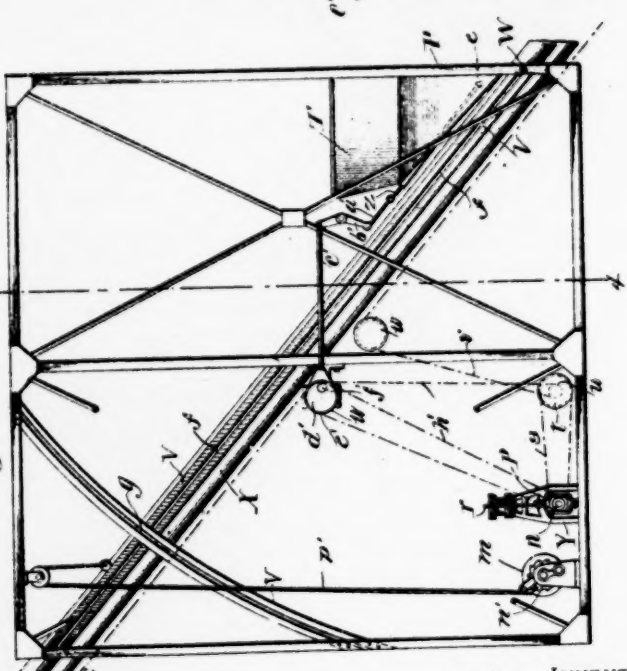


Fig. 5.



WITNESSES:

D. E. Wilcox

Jas. J. Shelby Jr.

INVENTORS

George W. Theiss

Robert J. W. Whann &

By William J. Englisbee

James J. Shelby Attorney

885

486

No. 866,166. PATENTED SEPT. 17, 1907.

G. W. THEISS, R. J. W. WHANN & W. J. ENGLISBEE.

LOADING AND UNLOADING APPARATUS.

APPLICATION FILED MAY 21, 1907.

4 SHEETS—SHEET 4.



Fig. 6.

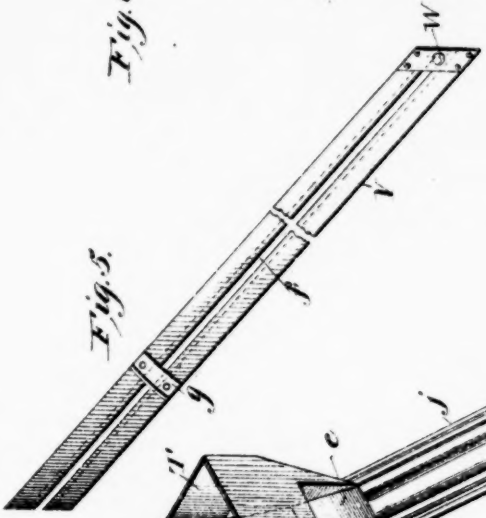


Fig. 5.

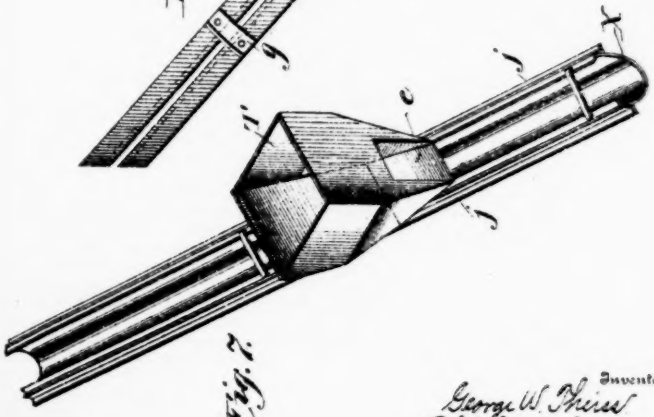


Fig. 7.

Witnesses:
D. C. Wilson
Jas. J. Shelby Jr.

Inventors
George W. Theiss
Robert J. W. Whann
William J. Englisbee

By James J. Shelby

Attorney

836

487

UNITED STATES PATENT OFFICE.

GEORGE W. THEISS, OF PITTSBURG, PENNSYLVANIA, AND ROBERT J. W. WHANN AND WILLIAM J. ENGLISBEE, OF NEW ORLEANS, LOUISIANA.

LOADING AND UNLOADING APPARATUS.

No. 866,166. Specification of Letters Patent. Patented Sept. 17, 1907.

Application filed May 21, 1907. Serial No. 374,290.

To all whom it may concern:

Be it known that we, GEORGE W. THEISS, ROBERT J. W. WHANN, and WILLIAM J. ENGLISBEE, citizens of the United States, the former residing at Pittsburg, in the county of Allegheny and State of Pennsylvania, and the two latter at New Orleans, parish of Orleans, State of Louisiana, have invented new and useful Improvements in Loading and Unloading Apparatus, of which the following is a specification.

Our invention pertains to loading and unloading apparatus and more particularly to loading and unloading apparatus for handling coal; and it has for one of its objects to provide a simple and efficient apparatus through the medium of which coal or other material may be expeditiously taken from a source of supply and elevated to various heights and there discharged into conveying means for taking it to the point desired.

Another object of the invention is the provision in a loading and unloading apparatus of a chute arranged to be positioned at various heights to receive coal or other material from the elevating means and also arranged to be swung vertically and adjusted in the direction of its length so as to position its discharge end at various distances from the vertical plane of the elevating means as circumstances require.

Another object is the provision in combination with the chute of a loading and unloading apparatus of a discharge nozzle connected with the discharge end of the chute in such manner that it is capable of being disposed in various directions to deflect the material being handled to different points about the discharge end of the chute.

Other advantageous features of our invention will be fully understood from the following description and claims when the same are read in connection with the accompanying drawings, forming part of this specification, in which:

Figure 1 is an elevation of the apparatus constituting the present and preferred embodiment of our invention. Fig. 2 is a view taken at a right angle to Fig. 1 and illustrating our apparatus in end elevation as properly arranged relative to a barge upon which coal is to be loaded, and also illustrating the vertically adjustable frame and the chute of the apparatus in various positions by full and dotted lines. Fig. 3 is a side elevation illustrating the vertically adjustable frame of the apparatus and the parts carried by said vertically adjustable frame as removed from the main frame. Fig. 4 is a transverse section taken in the plane indicated by the line 4–4 of Fig. 3, looking in the direction of the arrow. Fig. 5 is an enlarged detail view illustrating one of the vertically swinging supports and guides of the chute. Fig. 6 is an enlarged detail section showing the manner in which the said chute support and guide is pivotally connected with the vertically adjustable frame. Fig. 7 is a detail perspective view illustrating the arrangement of the hopper carried by the vertically adjustable frame and adapted to receive from the elevating receptacle, relative to the chute into which it is arranged to discharge material.

Referring by letter to the said drawings: A is a vessel upon which coal is to be loaded, and B is a barge upon which our novel apparatus is preferably, though not necessarily, arranged and carried; the said barge being designed to be arranged as shown in Fig. 2, relative to the vessel A, when coal is to be delivered to the latter.

C is a steam boiler arranged on the barge B and designed to supply steam for actuating the engines of the apparatus.

D is a clam-shell bucket for taking coal from a car or other source of supply and transferring the same to the storage bin, presently described, of our novel apparatus, and E is the means for raising and lowering the clam-shell bucket and swinging the same to and fro in horizontal planes; the said means E being carried by the barge B. The clam-shell bucket D and the means E may be and preferably are of the ordinary well known construction, and we have therefore deemed it unnecessary to illustrate and describe the said bucket D and means E in detail. In fact we would have it understood that while we prefer to employ the clam-shell bucket D and the means E for transferring coal to the before-mentioned storage bin, we do not desire to be understood as limiting ourselves to the said bucket and actuating means for the purpose, inasmuch as any transferring means consonant with our invention may be employed without involving departure from the scope of the invention as defined in the claims appended.

F is the main frame of our novel apparatus which is fixed to and rises to a considerable height from the barge B. The said main frame F may be of the general construction illustrated or of any other suitable general construction; and it is provided as best shown in Fig. 1 with a guideway G which extends between opposite sides thereof and is designed for the vertically adjustable frame presently described, and is also provided as best shown in Fig. 2 with a guideway G′ for the elevating receptacle presently described in detail.

At the lower end of the latter guideway G′ is arranged a scale H which may be of any suitable construction and is designed to weigh the coal deposited in the elevating receptacle I precedent to the raising of the said receptacle. The elevating receptacle I when in its lowermost position and on the scale H is positioned to receive coal from the discharge opening J of the fixed storage bin K; the said discharge opening J being controlled by a suitable door L so that when the said door is opened coal may pass from the bin to the

receptacle I after the manner shown in Fig. 1. We would also have it understood that in some cases the door L may be dispensed with, in which event coal discharged into the bin K will pass directly therethrough and into the elevating receptacle I.

The elevating receptacle I is connected through a cable M which passes over sheaves as shown in Fig. 1, with a hoisting engine N which *per se* forms no part of our invention and may therefore be of the ordinary well known construction or of any other elected construction. The elevating receptacle I is provided with an inclined bottom *a*, shown by dotted lines in Fig. 1; and it is also provided with a discharge opening *b* and a door *c* which normally closes the opening *b* to prevent coal from passing out of the receptacle. When, however, the receptacle I is raised to a predetermined height in the main frame F, the door *c* or an extension thereof brings up against a suitably positioned abutment *d* on the main frame and is moved by said abutment to an open position so as to permit coal to pass from the receptacle through the opening *b*. The abutment *d* is detachably connected to the main frame F and consequently it follows that said abutment may be positioned at various heights on the main frame F so as to effect the discharge of coal from the receptacle I at various heights.

P is the vertically adjustable frame of the apparatus which is arranged in the before-mentioned guideway G of the main frame F and is designed to be raised and lowered and adjustably fixed at various heights by the engine N through the medium of cables R and S past around sheaves as shown in Fig. 1. The said vertically adjustable frame P may be of the general structure illustrated or of any other suitable general structure without involving departure from the scope of our invention as claimed.

T is a hopper fixed to and carried by the vertically adjustable frame P and arranged in the position shown by full lines in Fig. 2 to receive coal from the discharge opening *b* of the elevating receptacle I and having a discharge opening *e*, best shown in Fig. 7, disposed at a right angle to the said discharge opening *b* of receptacle I. When the receptacle I is in the uppermost position shown in Figs. 1 and 2 and the door *c* thereof is open, the coal will obviously be chuted from the said receptacle I to the hopper T.

U U are slotted guideways which describe an arc of a circle and are spaced apart as best shown in Fig. 3 and are fixedly connected at their ends to the vertically adjustable frame P so as to be carried thereby.

V V are vertically swinging chute supports and guides which are pivoted at W to the vertically adjustable frame P at a point remote from the curvilinear guideways U and are of the form in cross-section shown in Figs. 4 and 6 so as to afford ways *f*, and are provided on their outer sides with shoes *g* of angular form in cross-section the outwardly directed portions of which are slidable in the curvilinear guideways U, and X is a chute which is open at its upper side throughout its length. The said chute X is preferably made up of sections *h* hinged together at *i*, and it is provided at diametrically opposite points with longitudinal ribs *j* which are disposed and movable endwise in the ways *f* of the chute supports and guides V, this in order to permit of the chute being moved endwise in order to discharge the coal at various distances from the vertical plane of the hopper T. From this it follows that by adjusting the vertically adjustable frame P and the chute X, the coal may be discharged into a bunker hole of a vessel at a point comparatively remote from the main frame F, as shown by full lines in Fig. 2, or may be discharged to the vessel at a point or points adjacent to the frame F as shown by dotted lines in said figure.

We prefer to raise the swinging ends of the chute supports and guides V through the medium of the mechanism illustrated in Fig. 3, but we do not desire to be understood as confining ourselves to the said mechanism inasmuch as any other mechanism suitable to the purpose may be employed without affecting our invention. The mechanism illustrated comprises a drum *m*, a ratchet mechanism *n'* for holding said drum against casual rotation, and a cable *p'* arranged on the drum and connected to one of the chute supports and guides V. The chute supports and guides V are connected together as shown in a manner that does not interfere with the endwise adjustment of the chute X therethrough; and by virtue of the mechanism described it will be seen that the supports and guides V may be moved to and adjustably fixed in different positions to pitch the chute X at various angles of inclination to adapt the said chute to discharge at the points desired.

At Y on the lower portion of the vertically adjustable frame P is located an engine, and on the drive-shaft *n* of the said engine is loosely mounted a clutch pulley *p* designed to be moved by a hand lever *r* into and out of engagement with a complementary clutch fixed on the said drive-shaft. The said pulley *p* is connected through a belt *s* with a pulley *t*, and with respect to the pulley *t* is fixed a drum *u* around which is looped a cable *v* which is passed over sheaves *w* and connected as indicated by *x* to widely separated portions of the chute X. By virtue of this construction it will be apparent that when the lever *r* is manipulated to put the clutch pulley *p* in engagement with the complementary clutch fixed on the drive-shaft *n* of the engine Y, the chute X will be moved endwise through the supports and guides V in one direction or the other according to the direction in which the engine shaft is caused to move, to extend the chute to a greater or less extent beyond the right hand side of main frame F, and that when the clutch pulley *p* is moved out of engagement with the complementary clutch on the shaft *n*, the chute X will be retained in the position in which it is placed.

Movable endwise through the back wall of the hopper T is a reciprocatory agitator Z which has for its office to facilitate the discharge of coal through the discharge opening *e* of the said hopper. This agitator Z is pivoted to a link *a'* and is connected through said link with one arm of a lever *b'*, Fig. 2, the other arm of which lever is pivotally connected to a rod *c'* which terminates in an eccentric strap *d'*. The said strap *d'* receives an eccentric *e'* on a shaft *f'* journaled in suitable bearings in the frame P, and in addition to the eccentric *e'* the shaft *f'* is provided with a pulley *g'*. This latter is connected through a belt *h'* with a pulley on the shaft *n* of the engine Y, and consequently it follows that when the engine is in action, the

shaft f' is rotated from the engine, and through the connection described the agitator Z is reciprocated by the said shaft f'.

As will be gathered from the foregoing the chute X rests under the hopper T and in the same vertical plane as the hopper discharge e, and hence it is obvious that when coal is discharged from the receptacle I into the hopper T, the coal will pass through the hopper T into the chute X and down the latter to the point of discharge.

In the general operation of the apparatus as thus far described, the clam-shell bucket D is employed to transfer coal from a car to the storage bin K, and the coal passes from said storage bin into the receptacle I when the latter is positioned as shown by full lines in Fig. 1. The receptacle I is then raised to the position shown by dotted lines in Fig. 1 when its contents will be discharged into the hopper T. From the hopper T the coal passes to the chute X, and by the latter it is conveyed to the point of discharge, the adjustable spout M^2 assisting in the latter function. The said discharge spout M^2 is swiveled on the lower end m^3 of the chute X, which lower end m^3 is of circular form in cross-section, and consequently it will be observed that by manipulating the said spout the coal may be deflected fore and aft of a vessel at the will of an attendant as well as directed downward.

It will be noted that by reason of the vertical adjustability of both the frame P and the chute X steam ships and other vessels of various heights above the water may be coaled with facility, and that the adaptability of the chute X to be extended to a greater or less extent beyond frame F is advantageous because it contributes to the facility with which coal may be properly placed in vessels of various widths. It will also be noted that the coal is conveyed to the bunker holes or hatches of vessels by gravity, and that the chute X may be placed at various angles of inclination when desired to regulate the flow of the coal.

In Fig. 2 of the drawings our novel apparatus is shown in proper relation to an elevated cable T' and a conveying receptacle U' movable on the said elevated cable. In the position illustrated the receptacle U' is arranged to receive from the discharge of the hopper T coal that is supplied to the hopper from the elevating receptacle I, and when filled the said conveying receptacle U' is moved by any suitable means along the cable T' to the point of discharge. This latter arrangement is obviously calculated to be used to advantage in handling coal on plantations and the like; the coal being transferred from cars to the elevating receptacle I in the manner before described in detail, and raised by the said receptacle and discharged by the latter into the hopper T from which it passes into the receptacle U' to be conveyed by the latter to the point at which it is stored.

It will be appreciated from the foregoing that notwithstanding the fact that our novel apparatus is possessed of large capacity and is adapted to be properly operated with but a minimum amount of attention, the apparatus is simple and inexpensive in construction and is also economical in operation.

By reference to Fig. 2 it will be seen that when the vertically adjustable frame P is in its lowermost position and the apparatus is idle, the upper section of the chute X may be positioned close against one side of the main frame F, this in order to lessen the liability of the chute fouling vessels or the rigging of vessels while the apparatus is being moved about a harbor.

Having described our invention, what we claim and desire to secure by Letters-Patent, is:

1. In a loading and unloading apparatus, the combination of a main frame having vertical guideways, a frame adjustable vertically in one of said guideways, means for adjusting and adjustably fixing the vertically adjustable frame, a hopper carried by the vertically adjustable frame, means for receiving material from the said hopper and conveying the same to a point of discharge, an elevating receptacle movable in the other guideway of the main frame and arranged when it reaches the proper position, relative to the hopper, to discharge its contents into said hopper, means for raising the elevating receptacle, and means for supplying material to said receptacle when the same is in a lower position.

2. In a loading and unloading apparatus, the combination of a main frame having vertical guideways, a frame adjustable vertically in one of said guideways, means for adjusting and adjustably fixing the vertically adjustable frame, a hopper carried by the vertically adjustable frame, means for receiving material from the said hopper and conveying the same to a point of discharge, a bin fixed with respect to the main frame and having a discharge, means for transferring material from a source of supply to the said bin, an elevating receptacle movable in the other guideway of the main frame and arranged in its lower position to receive from the bin and also arranged when it reaches the proper position, relative to the hopper on the vertically adjustable frame, to discharge its contents into said hopper, and means for raising the elevating receptacle.

3. In a loading and unloading apparatus, the combination of a frame, and a chute mounted in the frame and pivoted, whereby it is arranged to be swung vertically, and also arranged to be adjusted in the direction of its length with respect to the frame.

4. In a loading and unloading apparatus, the combination of a frame, a chute mounted in the frame and pivoted, whereby it is arranged to be swung vertically, and also arranged to be adjusted in the direction of its length, means for swinging the chute vertically and adjustably fixing the same at various angles of inclination, and means for adjusting the chute in the direction of its length and adjustably fixing it against endwise movement.

5. In a loading and unloading apparatus, the combination of a frame, a vertically swinging support and guide pivoted to the frame, means for adjustably fixing said support and guide at various angles of inclination, a chute carried by and arranged to swing with said guide and support and also arranged to be adjusted endwise on the guide and support, and means for adjustably fixing the chute with respect to the guide and support.

6. In a loading and unloading apparatus, the combination of a frame, a vertically swinging support and guide pivoted to the frame, means for swinging said support and guide vertically and adjustably fixing the same at various angles of inclination, a chute carried by and arranged to swing with said guide and support and also arranged to be adjusted endwise on the guide and support, and means for adjusting the chute endwise and adjustably fixing the same with respect to the guide and support.

7. In a loading and unloading apparatus, the combination of a frame, a vertically swinging support and guide pivoted to the frame, means for adjustably fixing said support and guide at various angles of inclination, a chute carried by and arranged to swing with said guide and support and also arranged to be adjusted endwise on the guide and support, a motor, a drum, a cable arranged to be moved by the drum and connected to opposite portions of the chute, and means for making and interrupting connection between the motor and the drum.

8. The combination in a loading and unloading apparatus, of a frame, an endwise adjustable chute mounted in

the frame, a motor, a drum, a cable connected with opposite portions of the chute and arranged to be moved by the drum, and means for making and interrupting connection between the motor and the drum.

9. The combination in a loading and unloading apparatus, of a main frame having a vertical guideway, a vertically adjustable frame disposed in said guideway, means for adjusting and adjustably fixing said vertically adjustable frame, a hopper carried by the vertically adjustable frame, means for elevating the material and discharging the same into the hopper, means for receiving material from the hopper and conveying the same to a point of discharge, a motor mounted on the vertically adjustable frame, a shaft bearing an eccentric and connected with the motor; said shaft being journaled in the vertically adjustable frame, a lever fulcrumed on the vertically adjustable frame, a rod connected with one arm of said lever and having a strap receiving the eccentric, and a reciprocatory agitator connected with the other arm of the lever and working through a wall of the hopper.

10. The combination in a loading and unloading apparatus, of a frame, a guide and support carried by said frame, a chute carried by and adjustable lengthwise on the guide and support and comprising sections hinged together at their meeting ends, and means for adjustably fixing the chute with respect to the guide and support and the frame.

11. In a loading and unloading apparatus, the combination of a frame, arcuate guideways connected to the frame, vertically swinging guides and supports pivoted to the frame and having shoes disposed in the arcuate guideways and also having guideways at their inner sides, means for adjustably fixing the said guides and supports, a chute having ribs at opposite sides disposed and movable endwise in the guideways of the guides and supports, whereby the chute is adjustable endwise on the guides and supports, and means for adjustably fixing the chute against endwise movement.

In testimony whereof we have hereunto set our hands in presence of two subscribing witnesses.

GEORGE W. THEISS.
ROBERT J. W. WHANN.
WILLIAM J. ENGLISBEE.

Witnesses as to George W. Theiss:
J. FRANK TILLEY.
J. M. RUSMISSEL.

Witnesses as to Robert J. W. Whann and William J. Englisbee:
J. N. EDWARDS.
LOUIS P. BRYANT.

840

492-493

No. 875,529.

PATENTED DEC. 31, 1907.

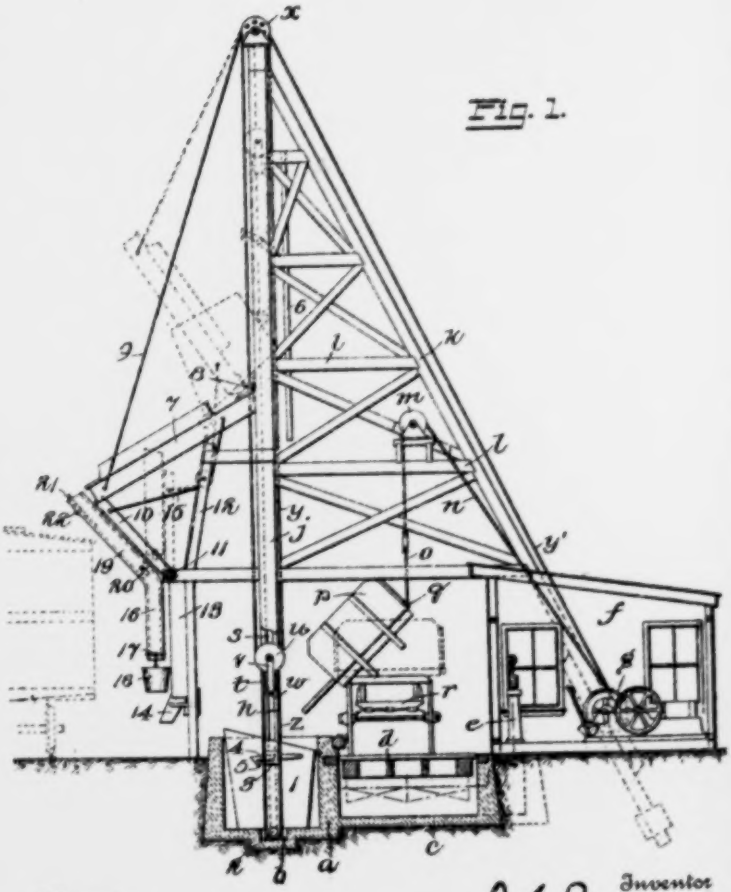
D. L. JOEHNCK.

APPARATUS FOR HANDLING BEETS.

APPLICATION FILED APR. 22, 1907.

3 SHEETS—SHEET 1.

Fig. 1.



Witnesses:
W. Mary Durall
J. Brinton

Inventor
D. L. Joehnck
By Williamson, Fisher & Watkinson
his Attorneys.

841

No. 875,529. 494-495 PATENTED DEC. 31, 1907.

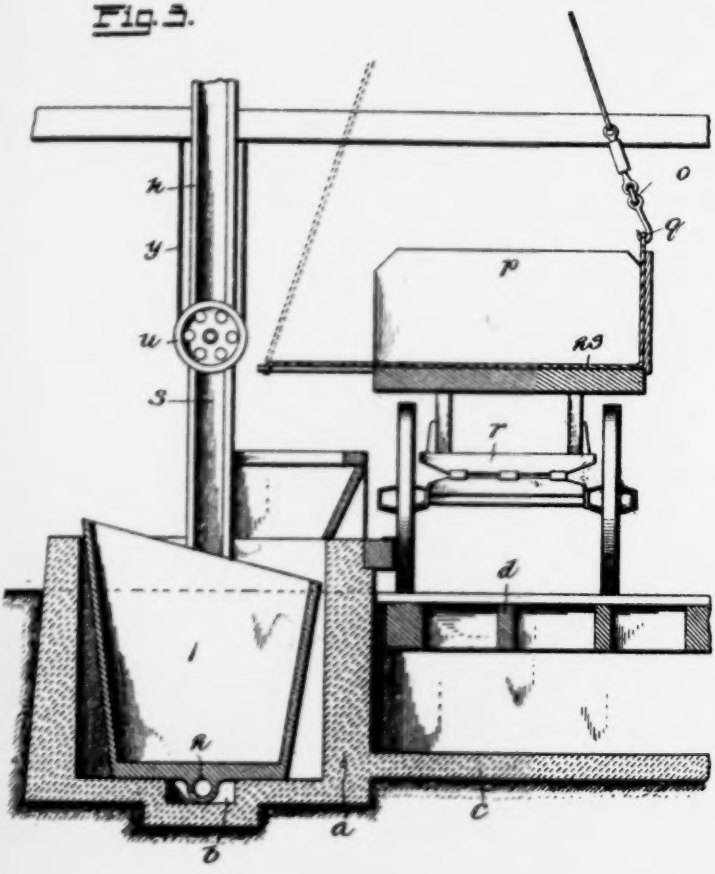
D. L. JOEHNCK.

APPARATUS FOR HANDLING BEETS.

APPLICATION FILED APR. 22, 1907.

2 SHEETS—SHEET 2.

Fig. 3.



Witnesses
M. Mapp Duvall
J. Hinsta.

Inventor
D. L. Joehnck.
Wilkinson, Poser & Witherspoon
his Attorneys

842

496

No. 875,529. PATENTED DEC. 31, 1907.

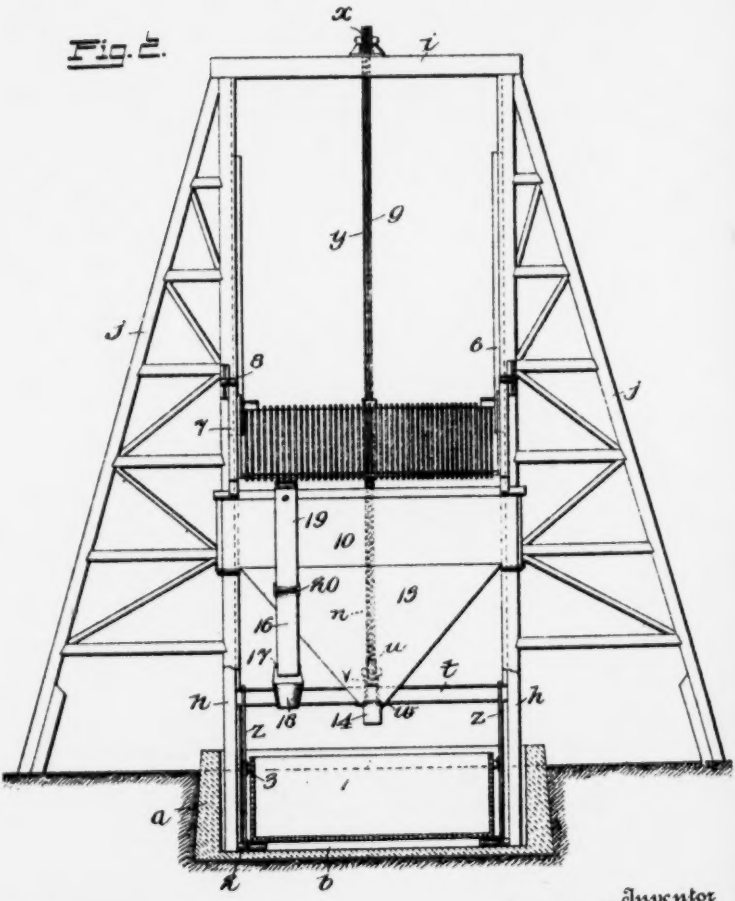
D. L. JOEHNCK.

APPARATUS FOR HANDLING BEETS.

APPLICATION FILED APR. 22, 1907.

2 SHEETS—SHEET 2.

Fig. 2.



Witnesses

M. Mae. Duvall.

J. Kinsta

Inventor

D. L. Joehnck.

by Williamson, Fider & Washington

his Attorneys

COPY BOUND CLOS

UNITED STATES PATENT OFFICE.

DETLEF L. JOEHNCK, OF ROCKY FORD, COLORADO.

APPARATUS FOR HANDLING BEETS.

No. 875,529. Specification of Letters Patent. Patented Dec. 31, 1907.

Application filed April 22, 1907. Serial No. 369,819.

To all whom it may concern:

Be it known that I, DETLEF L. JOEHNCK, a citizen of the United States, residing at Rocky Ford, county of Otero, State of Colorado, have invented certain new and useful Improvements in Apparatus for Handling Beets; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

This invention relates to improvements in loading apparatus.

In the following specification, for the purpose of brevity and clearness, reference is simply made to "beets" as the product to be handled, but it will of course be understood that instead of beets other products may be equally well handled, such for instance as other classes of tubers, corn, grain, coke, coal, stone, etc., and the employment of the word "beets" is not to be construed as restricting the invention to this particular use.

The invention is especially designed for the purpose of storing in large quantities, by directly conveying to the storage chamber such as a railroad car, wagon loads of the product, such as beets, which at the same time are screened from dirt and refuse matter, and a sample of each wagon load being procured while the articles are being transported from the wagon or similar vehicle to the railroad car, or other storing compartment.

While I do not limit myself to the exact details herein referred to, still for the purpose of disclosure reference is had to the accompanying drawings illustrating a practical embodiment of the invention, in which like letters designate the same parts in the several views, and in which:—

Figure 1 is a side elevation of my apparatus, the lower portion of the main upright frame being broken away and the bed of the pit being shown in section for the purpose of clearness in illustration. Fig. 2 is a front elevation of the apparatus, the lower portion of the main frame being broken away and the pit and the skip car being shown in transverse section, and Fig. 3 is a fragmentary local view on an enlarged scale showing the pit and skip car in vertical section, and a slightly modified form of dumping wagon.

In carrying out the invention broadly, I employ a platform scale, located adjacent a pit, and coöperating with a suitable upright support, a skip car therefor, hoisting means for the skip car, means for tripping the skip car at a predetermined position of elevation, means for screening the beets from the refuse matter and conveying the cleaned beets to the car or other storage compartment, and means for obtaining samples of each wagon load of beets, the whole coöperating to form an efficient apparatus for practically carrying out in a continuous operation the weighing of the load of beets, the conveying of same in a clean state to the car, and the obtaining of a sample of each wagon load.

a designates a pit for the reception of the skip car, which may be provided with the recessed center *b*, to receive the depending means for pivoting the skip car to the hoisting apparatus; *c* designates a base chamber for the reception of the platform *d* of the scales *e* located in a suitable shed *f*, containing drums operated by any suitable power, and designated by an engine conventionally, as at *g*. The pit *a* and compartment *c* may be of lumber, or cement or other masonry work, as shown.

Disposed above the pit *a* is located an upright support, which may be stayed in any suitable manner. In the drawings, this upright support consists of a vertical frame comprising the side members *h*, the top crosspiece *i*, the whole stayed by the laterally-extending truss frames *j* and the rearwardly-extending trussing frames *k*; each of said trussing frames consisting of the inclining main timbers and the cross bars *l*.

On one of the cross bars *l* may be suitably mounted a roller or sheave *m*, disposed above the platform of the scales, over which reeves a cable *n*, connected at one end to an operating drum of the engine *g* or other operating power and at its other end provided with a swivel and hook connection *o*, adapted to be secured to a tilting wagon body *p* as, for instance, by means of an eye *q*. The vehicle for conveying the beets to the scales, as shown in Fig. 1, simply consists of the wagon body *p*, detachably mounted on a suitable running gear *r*. The uprights or standards *h* of the vertical frame are preferably composed of channeled iron to form a guideway *s* for the reception of the ends of the vertically-slidable I-beam *t*, carrying at its center a pulley *u* preferably of the compound type, mounted in any suitable way, but shown in the drawings as carried by the side bars *v* passed through the I-beam and bent beneath

and secured to the lower web thereof, as shown at *w*. *x* designates a pulley preferably of the compound type, suitably mounted on the top cross-piece *i*, and *y* designates a cable secured in any suitable way at one end and associated with said compound pulleys and passing as at *y'*, to a drum operated by the engine or other power.

Suspended by the I-beam *t*, by means of the hanger straps *z*, is the skip car 1, consisting of a tilting bucket provided with base bearings, having trunnion pins 2, around which pass the hanger straps *z*. Rigidly mounted between the straps *z*, at a suitable position thereon, is a pair of spacing blocks 3, each carrying a pivoted latch 4, on opposite sides of the skip car, which pivoted latches 4 are adapted to engage with lugs 5 on the skip car. Disposed above said pit, and in alinement with the rear end of the latches 4 are a pair of trip bars 6, which obviously may be adjustably or rigidly connected with the framework. At a position on said upright frame, slightly above the bottom of said trip bars 6, is pivotally mounted a grizzly screen 7, which is shown as hinged to the upright frame, as at 8. The outer end of this grizzly screen is suspended by means of a cable or cables 9, reeving over pulleys on the cross bar *i* (not shown) in passing to the operating drums, 10 designating the front wall of an open hopper supporting the outer edge of the grizzly screen and pivoted as at 11 to a suitable support on the upright frame. This front wall 10 of the hopper cooperates with the rear wall 12 to deflect any screenings to a chute 13 communicating by means of a spout 14 with a wheelbarrow, or other means for conveying off refuse matter. The front wall of the hopper 10 is also connected with the grizzly screen 7 by means of a flexible connection 15, secured at one end to said front wall, thence reeving around a pulley mounted on said rear wall 12 of the hopper, and secured at its other end to the rear or hinged end of the grizzly screen.

Disposed at the lower or discharge end of the screen is mounted a sampler tube, preferably of sectional construction. This sampler tube is designed to be disposed in any position along the lower edge or discharge end of the screen. In the drawings, the lower section 16 of the sampler tube is shown as carried by the framework construction, and at its lower end is provided with a bracket 17 for suspending a receptacle 18 for the sample beets. The upper section 19 of the tube is shown as mounted on the pivoted front wall 10 of the hopper, a joinder with the lower section being made as at 20. The upper end of the section 19 is provided with a baffling plate 20 which may be adjustably connected to the tube in any suitable way, designated conventionally as by a locking screw 22. The construction shown in Fig. 3 is the same as that shown in the other figures, but instead of the tilting wagon body *p*, the same is provided with a rope net 23 for discharging the load of beets into the skip bucket 1.

In operation, referring to Figs. 1 and 2, a wagon load of beets is driven onto the scales, and after weighing same, the cable *n* is operated to tilt the wagon body and dump the beets into the skip bucket, after which the cable *y* is operated to elevate the skip bucket, and as soon as the latch 4 engages the lower end of the trip bar 6, the skip bucket is released, the latch being held in its elevated position, shown in dotted lines in Fig. 1, by sliding along the trip bar, and ready to engage the bucket and lock same in position upon its descent. At the same time when the latch is tripped, the forward end of the bucket is in a position just above the rear end of the screen, and consequently the rear end of the screen acts as a fulcrum for the forward end of the bucket which is gradually tilted over until it assumes the position shown in dotted lines. The beets being dumped onto the screen, the dirt, stone, and other refuse matter passes through the coarse screen, down through the hopper, and out of the chute 14 into a wheel barrow or other form of vehicle, while the discharged beets pass into the car or other storing chamber disposed at the end of the screen. During the passage of the beets past the sampler tube, however, some of the beets striking the baffling plate 21 will fall down through the sampler tube into the bucket 18, thereby furnish a sample of the load of beets being dumped.

The wagon with the load of beets having been initially weighed, and having also been weighed after dumping the load into the skip bucket, the true weight of the beets is ascertained by then weighing the refuse matter discharged through the tube 14, and subtracting the weight of this refuse matter plus the weight of the wagon from the gross weight of wagon and beets.

Having thus described the invention, what I claim is:—

1. The combination of an upright support, a skip car vertically movable thereon, an inclining screen projecting therefrom, a hopper disposed beneath said screen, a sampling chute disposed at the outer end of said screen, means for hoisting said skip car, and means tilting said skip car adjacent said screen for discharging the contents thereon, substantially as described.

2. The combination of an upright support, an inclining screen projecting therefrom, a movable support carried by said upright and means for hoisting said support, a skip car pivotally suspended by said movable support, a latch pivotally mounted on said movable support adapted to engage locking means on

said skip car, and means for tilting said skip car during its upward movement for discharging the contents thereof on said screen, comprising a tripping bar engaging the tail end of said latch, substantially as described.

3. The combination of an upright frame, an inclined screen carried thereby, a cross beam carried by said frame and mounted to slide therein, a skip car having a trunnion pin on each side thereof, a pair of hanger straps passing around said cross bar and said trunnion pins, a spacing block secured to one of said straps, a latch pivoted to said spacing block and cooperating with a lug on said skip car, means for elevating said cross bar, and means for tripping said latch comprising a trip bar projecting in the path of said latch below said inclining screen, substantially as described.

4. The combination of an upright support, a skip car movable vertically thereon and means for elevating same, a screen pivotally secured to said frame, a cable supporting the end of said screen, means for operating said cable, and means for tilting said skip car to dump the contents thereof on said screen, substantially as described.

5. The combination of an upright support, a pivoted screen carried thereby, a hopper disposed below said screen comprising a stationary rear wall and a pivoted front wall, the front wall of said hopper adapted to engage and support the outer end of said screen, a fixed pulley carried by said frame, a cable suspending the outer end of said screen and means for operating same, flexible means reeving around said fixed pulley and disposed between the upper end of said pivoted front wall and the rear end of said screen, a skip car vertically movable on said support, means for elevating said skip car, and means for tripping said skip car to tilt the contents thereof on said screen, substantially as described.

6. The combination of an upright support, an inclining screen projecting therefrom, a sampling tube disposed at the lower end of said inclining screen, a skip car carried by said frame, and means for elevating said skip car and tilting the contents thereof on said screen, substantially as described.

7. The combination of an upright support, an inclining screen projecting therefrom, a sampling tube disposed at the lower end of said inclining screen, a baffling plate projecting above said sampling tube, a skip car carried by said frame, and means for elevating said skip car and tilting the contents thereof on said screen, substantially as described.

8. The combination of an upright support, an inclining screen projecting therefrom, a sampling tube disposed at the lower end of said inclining screen, an adjustable baffling plate projecting above said sampling tube, a skip car carried by said frame, and means for elevating said skip car and tilting the contents thereof on said screen, substantially as described.

9. The combination of an upright support, a pivoted screen, a hopper disposed below said screen comprising a stationary rear wall and a pivoted front wall supporting the forward end of said screen, flexible means connecting said screen and pivoted front wall, a cable connected to said screen and means for operating said cable to elevate said screen, a sectional sampling tube the upper section carried by said pivoted front wall and the lower section being supported in a stationary position, a receptacle for catching the sample beets, a skip car vertically movable on said upright support, means for elevating said skip car, means for tripping same to tilt the contents thereof on said screen, and means for delivering a load of beets to said trip car, substantially as described.

In testimony whereof, I affix my signature, in presence of two witnesses.

DETLEF L. JOEHNCK.

Witnesses:
R. W. GIBBONS,
H. D. MACON.

846

502

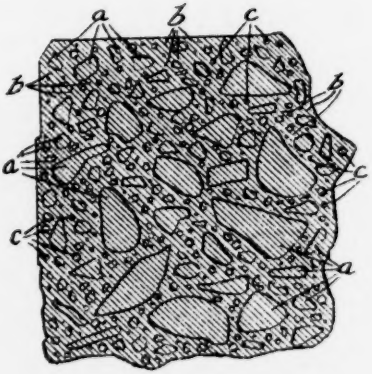
A. D. NEY.

ROCK LIKE SUBSTANCE.

APPLICATION FILED JULY 10, 1909.

939,072.

Patented Nov. 2, 1909.



Witnesses:
F. P. Bond
Elmaine Banning.

Inventor:
Alexander D. Ney
by Banning & Banning
Attys

847

503

UNITED STATES PATENT OFFICE.

ALEXANDER D. NEY, OF AURORA, ILLINOIS.

ROCK-LIKE SUBSTANCE.

939,072. Specification of Letters Patent. Patented Nov. 2, 1909.

Application filed July 10, 1909. Serial No. 506,980.

To all whom it may concern:

Be it known that I, ALEXANDER D. NEY, a citizen of the United States, residing at Aurora, in the county of Kane and State of Illinois, have invented certain new and useful Improvements in Rock-Like Substances, of which the following is a specification.

The object of the present invention is to produce a relatively hard, compact, and solid rock-like substance, composed, in part, of earthy materials, such as stones, pieces of rock, slag, pieces of brick, or similar natural or artificial mineral products, and, in part, of cement, which serves to unite the earthy materials into a solid mass.

In the making of concrete, it has hitherto been the general practice, in mixing the materials, to make the mass as stiff as possible, using only sufficient water to cause adherence of the materials together, and thereafter tamping the materials to cause the mass to be as compact as possible in its relatively dry condition.

In the operation of making the product of the present invention, a radically different method is followed in that an abundance of water is employed in order not only to permit gravity to bring the mass to a solid, compact condition, and thereby dispense with the ramming operation, but also to provide sufficient water for the purposes of crystallization. The process of forming the present product is essentially a wet process as distinguished from the relatively dry process employed in making concrete.

The drawing shows a piece of the present product, broken through the mass to illustrate the various ingredients employed and the character of the completed mass.

In carrying out the present process I employ particles *a* of stone, slag or other earthy material, which should be cleansed from vegetable substances, dirt or filth and are preferably graduated is size from the largest particles the work will permit, down to particles which are substantially the sizes of the particles of cement. These particles of earthy material should be used in a moist condition, since such particles will absorb a greater or less amount of water; and it is highly desirable that the water absorbed into the particles of earthy material be not withdrawn from the water stored up in the cement, and which is necessary for purposes of crystallization. The stone, slag or other earthy material should preferably be used in sufficient quantity to form the bulk of the mass, so that the cement will serve to unite the seams, but need not be used as a filler for large spaces or cavities, which would be an expensive way of combining the materials composing the mass. Furthermore, it is desirable to use a minimum quantity of cement in order to conserve the available quantity of water for purposes of crystallization. A sufficient amount of cement *b* should be used to thoroughly cement the seamage of the mass, the earthy particles being relied upon to give the necessary bulk to the mass. A sufficient quantity of water should be used in the mixture to cause it to liquidate sufficiently to allow gravity to bring the material to a solid mass, having within its body and stored in cells or cavities a reserve supply of water which will be drawn upon to assist in the crystallization of the materials. When the above mass of materials is thoroughly mixed, it should be stirred in a mixing manner within the form, to cause the material to thoroughly fill the form and take on the shape of the form.

During the mixing operation, the cement will be evenly and thoroughly spread over the surface of the stone, slag or other earthy particles of material, so that the cement will be in position to unite in a satisfactory manner with all the exposed surface of the particles of earthy material. If a sufficient quantity of water has been used in the mixing of the materials, a layer of water will be present on the surface of the materials after the mixing operation, and the mixing should be continued in the form so long as any air bubbles appear on the surface of the water, which air bubbles indicate the presence of air voids in the body of the mass of fresh material, which should be eliminated before the initial crystallization of the mass. During the progress of crystallization, the layer of water on the top of the mass will gradually disappear, uniting with the cement in the crystallizing action.

After the mass has normally crystallized, which takes place during about thirty days or more, it will, when broken, cleave through the particles of rock or other earthy material, indicating that the entire mass is of substantially equal strength, where stone, slag or other similar earthy material of ordinary strength is used. An inspection of the broken surface will show that the particles of earthy material are entirely and com-

pletely embedded in and surrounded by the cement, so that practically no air holes or interstices will be present, save only that the mass will be interspersed with small cells or cavities *c* having a smooth rounded surface, which cells or cavities indicate the spaces from which water has been drawn by crystallization.

The product of the present invention differs from certain prior products, by reason of the presence of such cells or cavities, which would be lacking if the mass were subjected to a pressure tending to expel the water prior to the crystallization. The water being lighter than the other bodies of materials used in the mass, a pressure caused by tamping or ramming would bring the water to the top of the material and destroy the uniform position of the cells in which the reserve supply of water is held. The product of the present invention is superior to ordinary tamped concrete, in strength, uniformity, hardness and durability, and more impervious to the penetration of water. Furthermore, by dispensing with the tamping or ramming process, the present product can be produced more quickly and easily, and will more perfectly shape itself to the intended form.

The product of the present invention is especially adapted for use in forming the lower or ground layer of sidewalks, and for general construction.

I claim:

1. A rock-like substance, composed, in part, of particles of earthy material, and having the seams intermediate such particles filled with crystallized cement, the mass having therein cells or cavities formed by the withdrawal of water by crystallization, substantially as described.

2. A rock-like substance, composed, in part, of particles of earthy material of graduated sizes, and having the seams intermediate such particles filled with crystallized cement, the mass having therein cells or cavities formed by the withdrawal of water by crystallization, substantially as described.

3. A rock-like substance, composed, in part, of particles of earthy material of graduated sizes, proportionate from the largest particle the work will permit down to the size of the particles of cement used, and having the seams intermediate such particles filled with crystallized cement, the mass having therein cells or cavities formed by the withdrawal of water by crystallization, substantially as described.

4. A rock-like substance, composed, in part, of particles of earthy material, completely coated with crystallized cement to unite the seamage between the particles, and the mass having therein cells or cavities formed by the withdrawal of water by crystallization, substantially as described.

5. A rock-like substance, composed, in part, of particles of earthy material of graduated sizes, completely coated with crystallized cement to unite the seamage between the particles, and the mass having therein cells or cavities formed by the withdrawal of water by crystallization, substantially as described.

6. A rock-like substance, composed, in part, of particles of earthy material of graduated sizes, proportionate from the largest particle the work will permit down to the size of the particles of the cement used, completely coated with crystallized cement to unite the seamage between the particles, and the mass having therein cells or cavities formed by the withdrawal of water by crystallization, substantially as described.

7. A rock-like substance, composed, in part, of particles of earthy material, completely coated with crystallized cement to unite the seamage between the particles, and the mass having the air voids eliminated by stirring in a mixing manner, and having therein cells or cavities formed by the withdrawal of water by crystallization, substantially as described.

ALEXANDER D. NEY.

Witnesses:
FRANCES M. FROST,
SAMUEL W. BANNING.

859

506

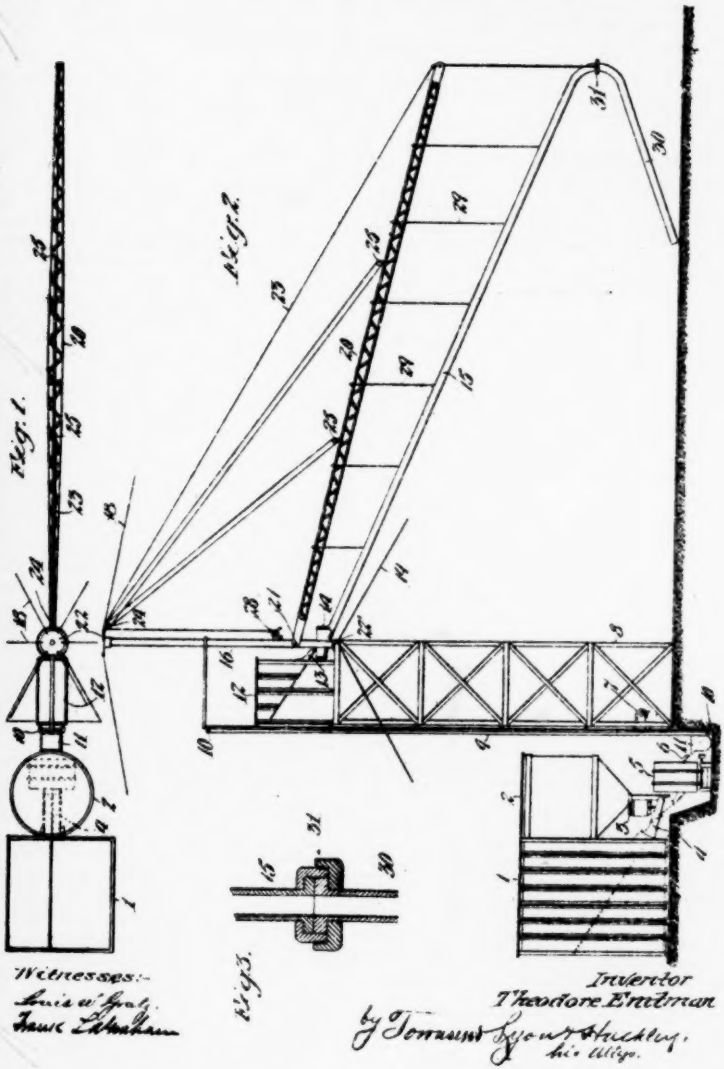
T. EMTMAN.

PLANT FOR CONCRETE CONSTRUCTION.

APPLICATION FILED FEB. 17, 1909.

948,723.

Patented Feb. 8, 1910.



Witnesses:-
Louis W. Gratz
Isaac Lehmann

Inventor
Theodore Emtman
by Townsend Lyon & Stockley,
his Attys.

850

507

UNITED STATES PATENT OFFICE.

THEODORE EMTMAN, OF LOS ANGELES, CALIFORNIA, ASSIGNOR, BY MESNE ASSIGNMENTS, TO CONCRETE APPLIANCES COMPANY, OF ST. LOUIS, MISSOURI, A CORPORATION OF MISSOURI.

PLANT FOR CONCRETE CONSTRUCTION.

948,723. Specification of Letters Patent. Patented Feb. 8, 1910.

Application filed February 17, 1909. Serial No. 478,320.

To all whom it may concern:

Be it known that I, THEODORE EMTMAN, a citizen of the United States, residing at Los Angeles, in the county of Los Angeles and State of California, have invented a new and useful Plant for Concrete Construction, of which the following is a specification.

The object of the present invention is to provide an economical and practical plant for the construction of cement buildings or structures, and it is particularly adapted to the construction of large structures where economy in transportation and pouring of the cement is an important factor in the cost.

The main object of the present invention is to provide a plant whereby the cement can be economically and rapidly delivered to any part of the work or structure.

Another object of the invention is to provide a complete apparatus for performing the entire operation of preparing and delivering the cement or concrete.

Other objects of the invention will appear hereinafter.

The accompanying drawings illustrate my invention.

Figure 1 is a plan of the plant. Fig. 2 is a side elevation thereof. Fig. 3 is a section of the swivel for the delivery pipe.

The plant comprises a preparing apparatus and a delivery apparatus arranged to take the cement or concrete from the mixing apparatus and to deliver it to any desired location over a more or less extended range.

The mixing apparatus comprises a bin 1 for containing sand, gravel, etc., a bin 2 for containing the cement, and a tank 3 for water, a measuring receptacle 4 being provided to take definite portions of sand and gravel from the bin 1 and deliver such portions to the rotary mixer 5, bins 1 and 2 and tank 3 being adapted to deliver the sand or gravel, cement and water to the rotary mixer 5 by gravity. Rotary mixer 5 is of any suitable construction, such as is well known in the art and is provided with an outlet or delivery chute or means 6.

The delivery apparatus comprises an elevator for lifting the concrete to a suitable height to enable it to run to any part of the range of the apparatus by gravity, and a chute taking such concrete from the elevator and delivering it by gravity to the point desired. A tower or frame 8, which may be built in stages, as shown, so as to enable it to be made of any required height, supports the elevator 9 which may consist of an endless cable or carrier mounted on pulleys 10, carrying a bucket 11, which, in the vertical movement of the carrier, is adapted to pass under the mouth of the delivery chute 6 of the rotary mixer 5, the bucket 11 being then in its lowest position. A hoist or other means 7 is provided for operating the elevator 9. A bin or hopper 12 is provided at the top of the tower 8 in position to receive the contents of the bucket 11 when the latter is carried by the elevator carrier 9 to the top of the hopper 12 and dumped. Said hopper 12 has a delivery chute 13, extending over an open-topped receptacle or mouth 14 at the upper end of the delivery chute 15. Said delivery chute is mounted on a vertical mast 16 to turn horizontally, said mast being supported on the tower 8 and being guided if necessary by lateral guy ropes 18. Guy ropes 19 may also be provided to brace the lower end of the mast 16. A boom or derrick member 20 is pivoted at 21 to said mast 16 so as to turn thereon in a vertical plane and is supported in a proper position by means of a cable 23 passing over pulleys 24, 25, respectively, on the cap-plate 22 at the top of the mast and on the boom said cable forming an extensible connection. The under end of this cable passes to a winch 26 whereby the boom 20 may be raised or lowered as required. Chute 15 is suspended from boom 20 by any suitable means, for example, by suspension rods 29. To the lower end of the chute 15 is connected a delivery pipe 30 having a swivel connection 31 with the chute or pipe 15 so that the pipe 30 can be swung around on a horizontal plane. The delivery apparatus is capable of the following movements to enable it to cover an extended vertical and horizontal range. In a horizontal plane the means 16 together with the boom and the delivery means 30 carried thereby may be turned in a horizontal plane by the rotation of the mast in the cap plate 22 and the step-bearing 22′ at the bottom thereof. The pipe 30 may be swung in a horizontal plane by turning on its swivel 31 so as to distribute the cement in a particular part of the work or construction,

within a radius equal to the projection of the delivery pipe when fully extended.

The plant is operated as follows:—Sand or gravel from bin 1, cement from bin 2, and water from tank 3 are charged intermittently by means of device 4 to the rotary mixer 5, by the operation of which these ingredients are mixed to form the concrete. The bucket 11 of the elevator is brought repeatedly to lowermost position to receive the mixed concrete and the concrete having been dumped thereinto the bucket is raised by the elevator to the top of the tower and its contents are discharged into the bin 12, whence such contents pass by gravity into the chute 15 and down said chute and through the delivery pipe 30 to the outlet of said pipe. By turning said pipe 30 in its swivel 31, the cement is distributed over the part of the work that is being operated upon for the time being. When it is desired to shift the operation from one part of the structure to another the chute 15 can be swung on the mast 16 as a center. As the construction progresses the chute 15 may be raised by means of the devices 23, etc. to keep pace with the elevation of the structure, the upper end of chute 15 fitting sufficiently loose on the mast 16 to permit of this movement, and the enlarged mouth at the upper end of the chute maintaining its proper relation for receiving concrete from the bin 12.

What I claim is:—

1. A plant for concrete construction comprising an elevator provided with means for receiving and raising concrete, a chute adapted to receive the concrete raised by the elevator and to deliver the same by gravity, a mast mounted to rotate on a vertical axis, a chute pivoted to said mast and extending therefrom at an inclination to feed the concrete by gravity, and a boom supporting said chute and having extensible connection with the mast to vary its vertical position.

2. A plant for concrete construction comprising an elevator provided with means for receiving and raising concrete, a chute adapted to receive the concrete raised by the elevator and to deliver the same by gravity, a mast mounted to rotate on a vertical axis, a chute pivoted to said mast and extending therefrom at an inclination to feed the concrete by gravity, a boom supporting said chute and having extensible connection with the mast to vary its vertical position, and a delivery pipe swiveled to the lower end of said chute to turn it to different angular positions.

In testimony whereof, I have hereunto set my hand at Los Angeles, California, this 6th day of February 1909.

THEODORE EMTMAN.

In presence of—
G. T. Hackley,
Frank L. A. Graham.

852

510-511

T. F. LONNEY.

EXCAVATING MACHINE.

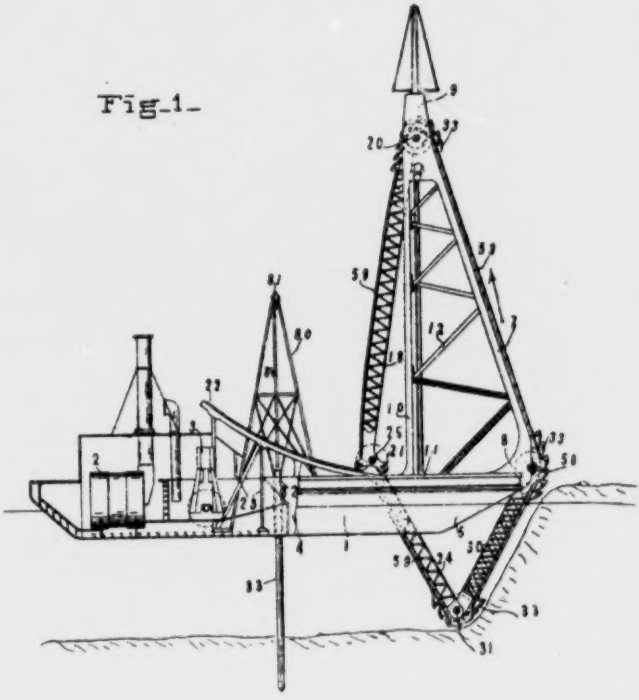
APPLICATION FILED NOV. 10, 1906. RENEWED JUNE 29, 1910.

969,172.

Patented Sept. 6, 1910.

11 SHEETS—SHEET 1.

Fig. 1.



WITNESSES

Arthur Perry.

R. F. Martin

INVENTOR

T. F. Lonney

BY

Duell, Warfield & Duell

ATTORNEYS

853

T. F. LONNEY. 512-513

EXCAVATING MACHINE.

APPLICATION FILED NOV. 10, 1908. RENEWED JUNE 29, 1910.

969,172. Patented Sept. 6, 1910.

11 SHEETS—SHEET 2.

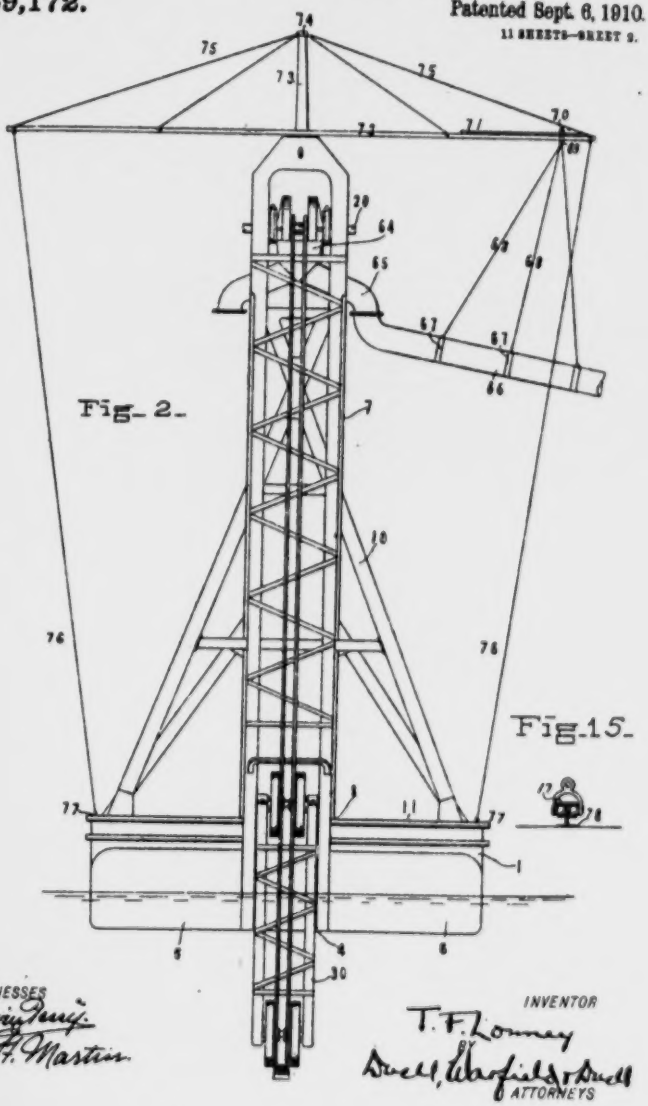


Fig. 2.

Fig. 15.

WITNESSES

Louis Penney

R. F. Martin

INVENTOR

T. F. Lonney

BY

Duell, Warfield & Duell

ATTORNEYS

854

514-515

T. F. LONNEY.

EXCAVATING MACHINE.

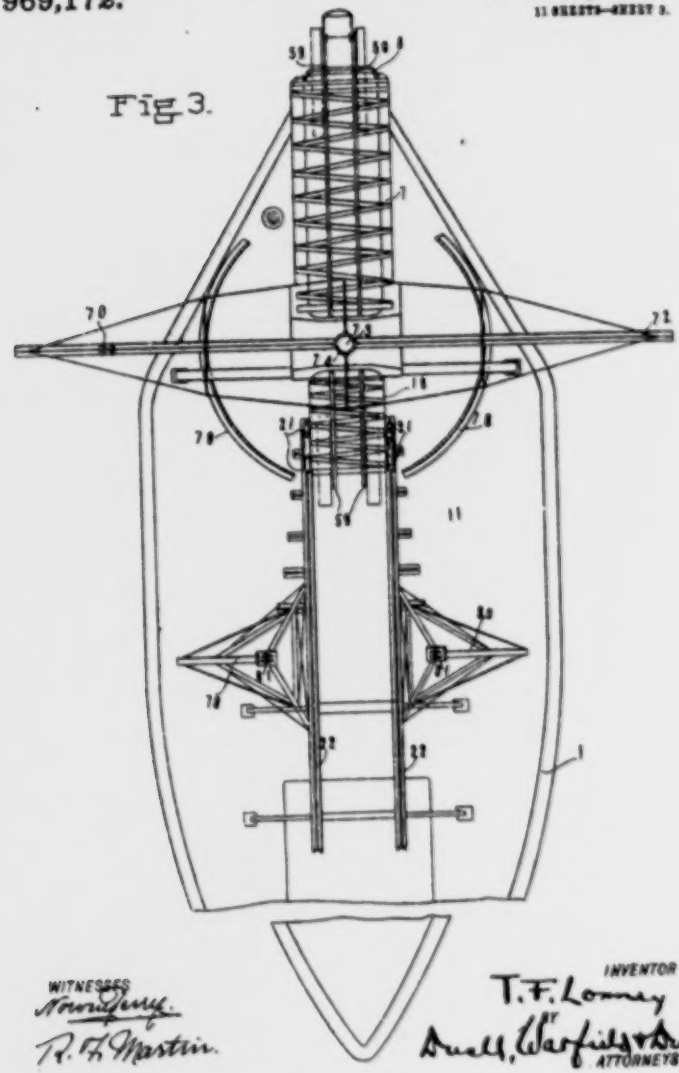
APPLICATION FILED NOV. 10, 1909. RENEWED JUNE 20, 1910.

969,172.

Patented Sept. 6, 1910.

11 SHEETS—SHEET 3.

Fig 3.



WITNESSES

INVENTOR

T. F. Lonney

Duell, Warfield & Duell

ATTORNEYS

855

T. F. LONNEY.

516-517

EXCAVATING MACHINE.

APPLICATION FILED NOV. 10, 1909. RENEWED JUNE 29, 1910.

969,172.

Patented Sept. 6, 1910.

11 SHEETS—SHEET 4.

Fig. 4.

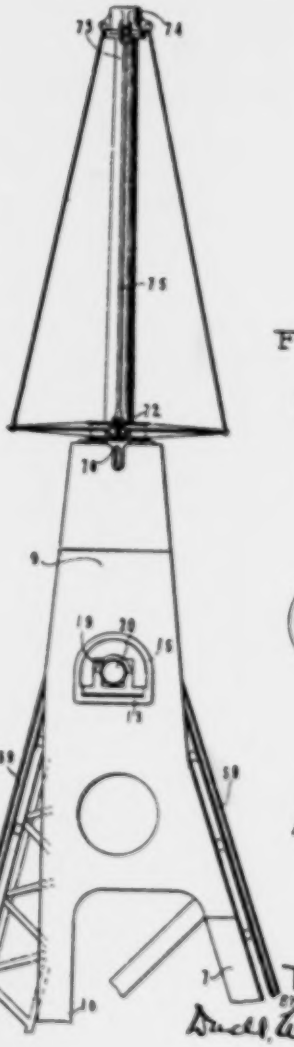


Fig. 16.



WITNESSES

INVENTOR

T. F. Lonney

BY

ATTORNEYS

856

518-519

T. F. LONNEY.

EXCAVATING MACHINE.

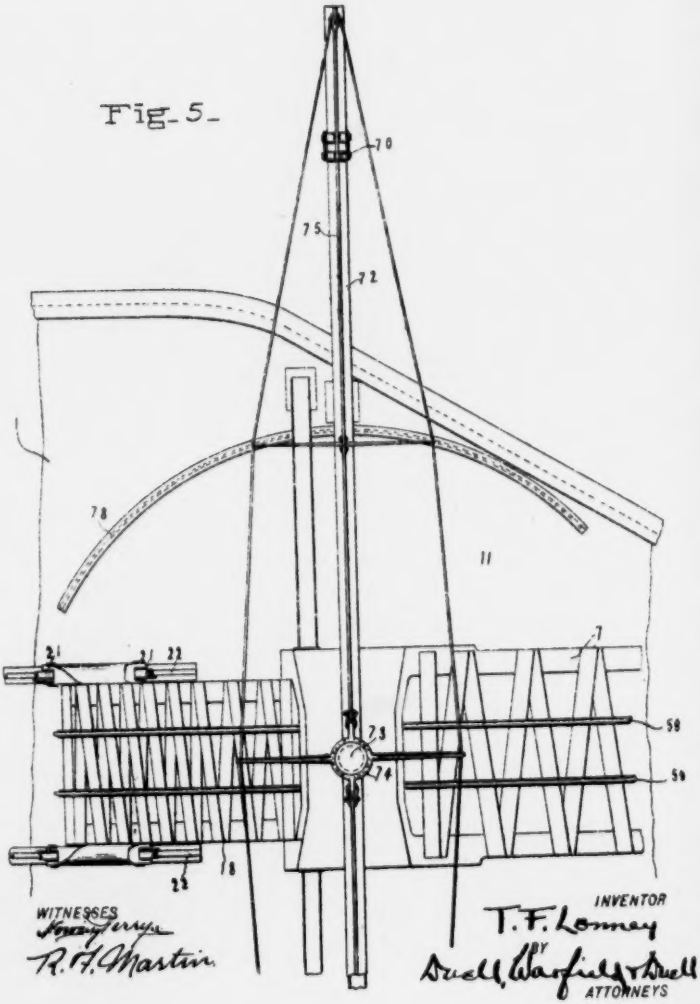
APPLICATION FILED NOV. 10, 1906. RENEWED JUNE 20, 1910.

969,172.

Patented Sept. 6, 1910.

11 SHEETS—SHEET 5.

Fig. 5.



WITNESSES

R. H. Martin

INVENTOR

T. F. Lonney

BY

Duell, Warfield & Duell

ATTORNEYS

857

T. F. LONNEY.

520–521

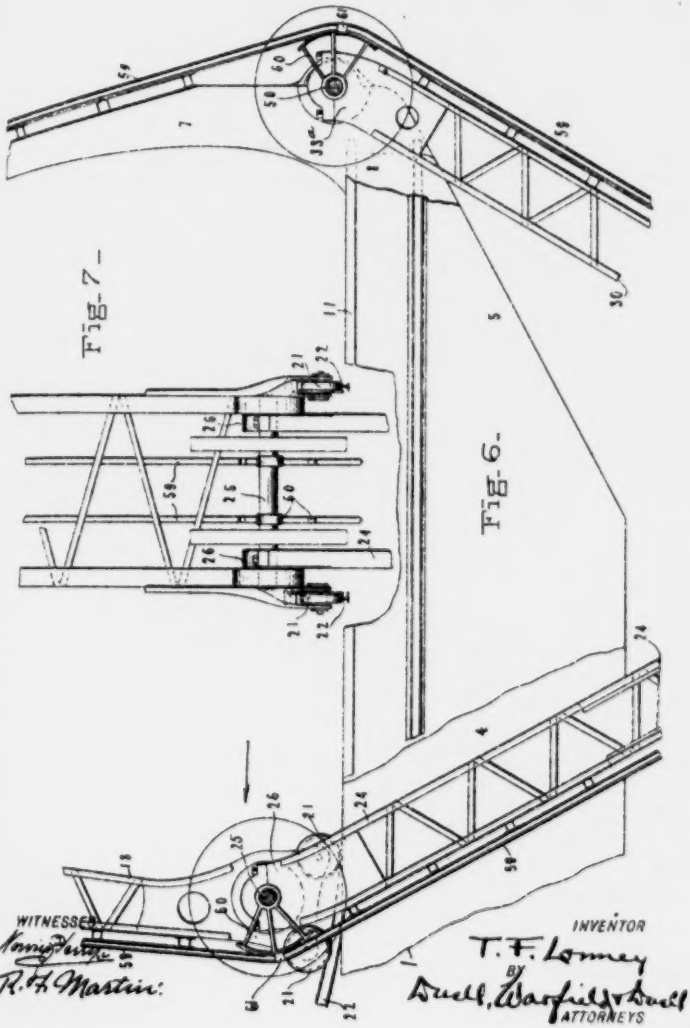
EXCAVATING MACHINE.

APPLICATION FILED NOV. 10, 1906. RENEWED SEPT. 29, 1910.

969,172.

Patented Sept. 6, 1910.

11 SHEETS—SHEET 6.



WITNESSES:
Nancy Penrose
R. H. Martin.

INVENTOR
T. F. Lonney
BY
Duell, Warfield & Duell
ATTORNEYS

858

522-523

T. F. LONNEY.

EXCAVATING MACHINE.

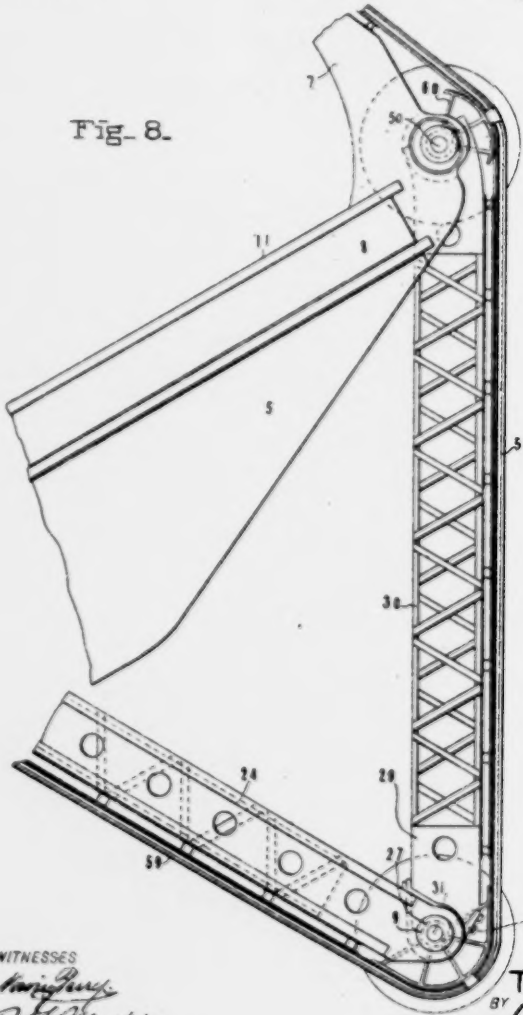
APPLICATION FILED NOV. 10, 1908. RENEWED JUNE 29, 1910.

969,172.

Patented Sept. 6, 1910.

11 SHEETS—SHEET 7.

Fig. 8.



WITNESSES

Marie Berry

R. H. Martin

INVENTOR

T. F. Lonney

BY

Duell, Wakefield & Duell

ATTORNEYS

859

524-525

T. F. LONNEY.

EXCAVATING MACHINE.

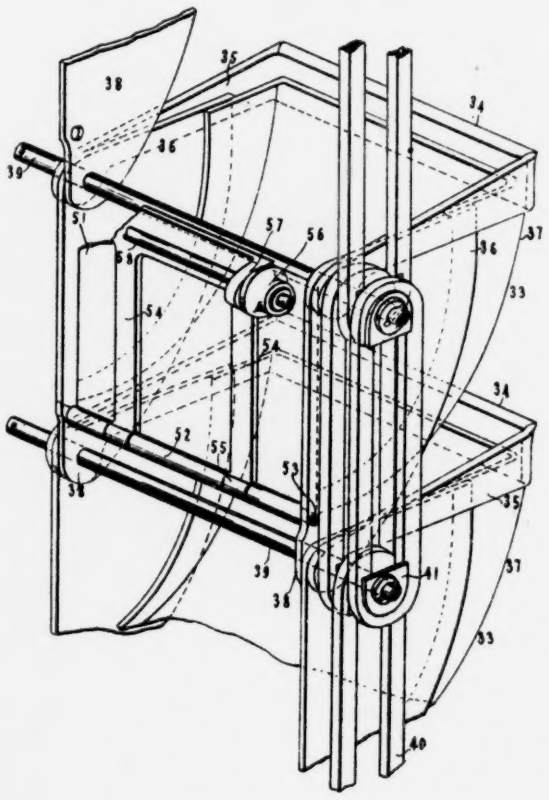
APPLICATION FILED NOV. 10, 1906. RENEWED JUNE 20, 1910.

969,172.

Patented Sept. 6, 1910.

11 SHEETS—SHEET 8.

Fig. 9.



WITNESSES

INVENTOR

T. F. Lonney

BY

Duell, Warfield & Duell

ATTORNEYS

860

526-527

T. F. LONNEY.

EXCAVATING MACHINE.

APPLICATION FILED NOV. 10, 1906. RENEWED JUNE 29, 1910.

969,172.

Patented Sept. 6, 1910.

11 SHEETS—SHEET 9.

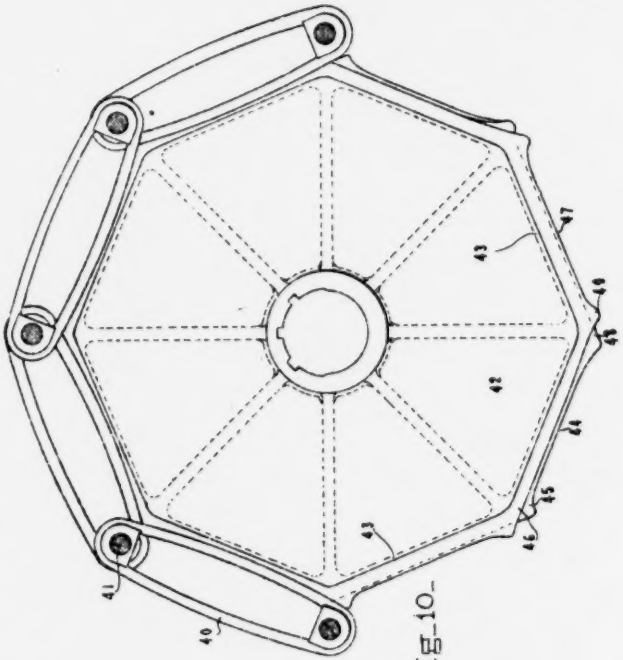


Fig. 10.

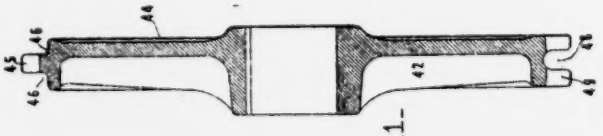


Fig. 11.

WITNESSES

Sowing Gang.

R. H. Masten.

INVENTOR

T. F. Lonney

BY

Duell, Warfield & Duell,

ATTORNEYS

861

T. F. LONNEY.

528-529

EXCAVATING MACHINE.

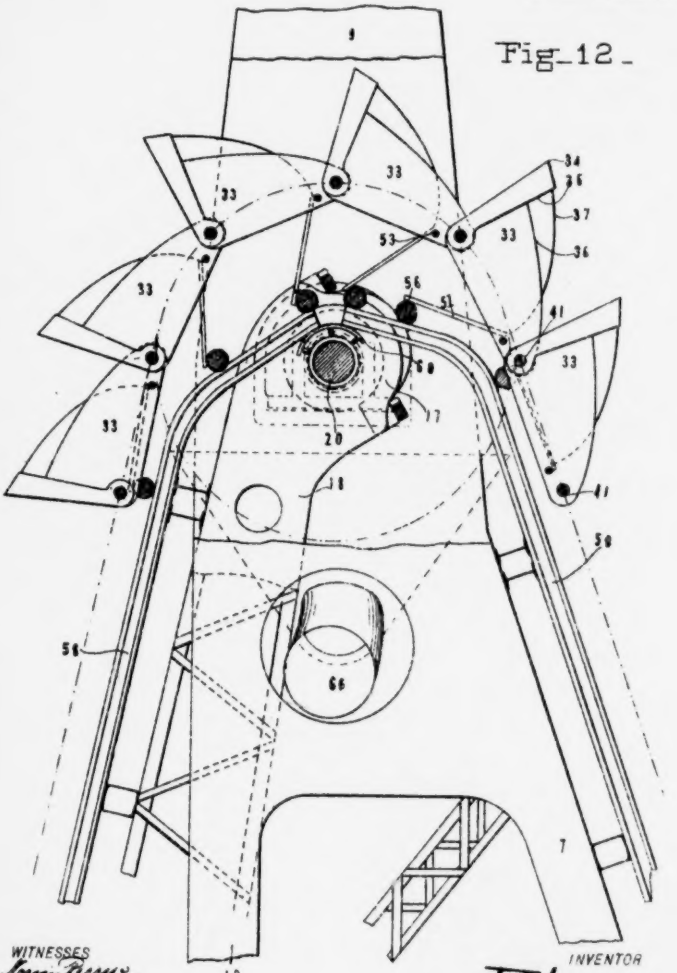
APPLICATION FILED NOV. 10, 1906. RENEWED JUNE 29, 1910.

969,172.

Patented Sept. 6, 1910.

11 SHEETS—SHEET 10.

Fig. 12.



WITNESSES

R. H. Martin.

INVENTOR

T. F. Lonney

BY

Duell, Warfield & Duell

ATTORNEYS

802

530

T. F. LONNEY.

EXCAVATING MACHINE.

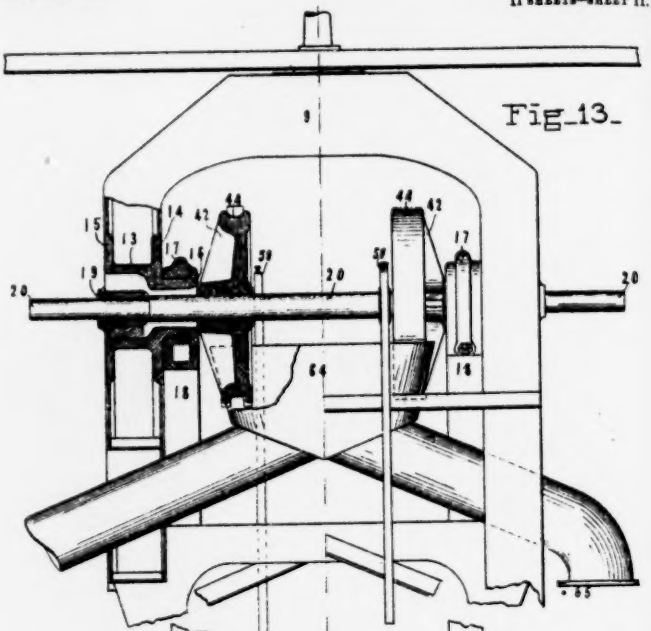
APPLICATION FILED NOV. 10, 1906. RENEWED JUNE 29, 1910.

969,172.

Patented Sept. 6, 1910.

11 SHEETS—SHEET 11.

Fig. 13.



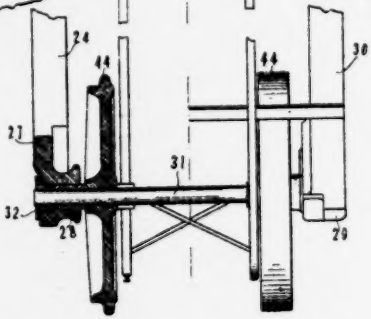


Fig. 14.

WITNESSES:

Nowitzky

R. F. Martin

INVENTOR

T. F. Lonney

BY

Duell, Warfield & Duell

ATTORNEYS

UNITED STATES PATENT OFFICE. 531

THOMAS F. LONNEY, OF BROOKLYN, NEW YORK, ASSIGNOR TO GEORGE UPINGTON, OF BROOKLYN, NEW YORK.

EXCAVATING-MACHINE.

969,172. Specification of Letters Patent. Patented Sept. 6, 1910.

Application filed November 10, 1906, Serial No. 342,782. Renewed June 29, 1910. Serial No. 569,581.

To all whom it may concern:

Be it known that I, THOMAS F. LONNEY, residing at Brooklyn, in the county of Kings and State of New York, have invented certain new and useful Improvements in Excavating-Machines, of which the following is a full, clear, and exact description, such as will enable others skilled in the art to which it appertains to make and use the same.

This invention broadly relates to means for excavating material, but since certain of its characteristic advantages prominently appear when it is resorted to for the purpose of enlarging or constructing new waterways, it will be conducive to clearness to describe an embodiment especially adapted for such use.

One object of this invention is to provide a means of the class described which will excavate material in advance of the excavating apparatus, so that the latter may continuously advance and cut its own channel.

Another object is to provide an excavating apparatus which operates by means of an endless chain of buckets and in which the slope of the cutting line may be arranged to conform to various positions without necessitating a variance in the length of the endless chain of buckets.

Another object is to devise an excavating apparatus in which the cutting may take place along a runway rising to the beak of the boat, and in which such runway may be given any desired slant, so that the buckets may gather material continuously throughout their length of travel along such runway, and so that the material may be gathered from the superficial submerged surface of the bank and therefore be of a relatively soft nature.

Another object of this invention is to devise an apparatus of the class described which will gather the material to be excavated in such a way that it will be loosely retained in the scoop and thus be in a condition admitting of a ready discharge from the buckets without imposing undue shock or strain upon the apparatus.

Another object is to provide an excavating device of the described nature with means whereby it may be maintained in a given position and be capable of being swung about a center post to cut channels of various widths.

Another object is to devise an excavator which provides means for progressively advancing the whole against the bank, simultaneously with a side to side oscillation of the cutting line.

Another object is to provide an excavator which from an operative standpoint will, in usage, possess a high degree of efficiency and effectiveness, and which, structurally considered, will be of the greatest possible simplicity, being composed of but few parts, all adapted for being made at a minimum of cost and individually so formed as to be capable of being readily assembled into a compact and highly mechanical arrangement for accomplishing the purposes intended.

Other objects and advantages will be in part obvious and in part pointed out hereinafter.

The invention accordingly consists in the features of construction, combinations of elements and arrangement of parts which will be exemplified in the construction hereinafter set forth, and the scope of the application of which will be indicated in the following claims.

In order that this invention may be more fully understood and made comprehensible to others skilled in its relating arts, drawings illustrating a practical manner of carrying out the same are appended as a part of this specification, and, while the controlling principles of the invention may be otherwise applied by modifications falling within the scope of the claims, the herein disclosed embodiment is that which will ordinarily be preferred in practice and is regarded as representing substantial improvements over the many obvious and implied variations of the same.

In such drawings like numerals refer to corresponding parts throughout all the figures, of which—

Figure 1 is a side elevation showing the excavator in operation, a side of the boat being cut away to give a diagrammatic representation of the mounting of the engine and boilers relatively to the collapsible excavating framework and also showing a steady pile anchored to the bottom of the waterway; Fig. 2 is an end elevation looking toward the front of the apparatus and illustrating certain details not apparent from the preceding figure; Fig. 3 is a top plan

view showing the general arrangement of the parts of this apparatus and their mountings upon the float or vehicle supporting the same; Fig. 4 is a fragmentary elevation on an enlarged scale to show in detail the top brace or crane which serves to position and carry the discharge chute, together with the various features incidental to the same; Fig. 5 is an enlarged fragmentary view in elevation, showing the apex of the excavating framework and the mounting of the top brace or crane carried at the summit thereof; Fig. 6 is an enlarged elevation showing details of the intermediate joints and the arrangement of the corresponding parts of the runway; Fig. 7 is an elevation of the movable intermediate joint looking at the same from the inside, *i. e.*, in the direction of the arrow shown on Fig. 6; Fig. 8 is a side elevation of the toe of the apparatus and the forward fixed intermediate joint, illustrating the general arrangement and construction of the shown parts; Fig. 9 is a sectional perspective, showing the construction and arrangement of the buckets constituting units of the endless excavating chain; Fig. 10 is a side elevation of one of the turning wheels which is mounted at each hinge of the collapsible framework to carry the endless excavating chain; Fig. 11 is a vertical section of the wheel illustrated in Fig. 10; Fig. 12 is a sectional elevation of the apex of the excavator, showing the manner in which the swinging doors are opened to discharge the contents of the buckets rounding such apex; Fig. 13 is a sectional elevation taken along an axial plane through Fig. 12 to illustrate certain features not clearly apparent from the aforesaid figure; Fig. 14 is a sectional elevation through the toe of the excavating apparatus and showing the arrangement of certain parts not clearly set forth in the preceding figures; Fig. 15 is a sectional view of an arc-shaped runway on the deck of the boat to which the lower end of the stay for the upper crane is slidably affixed; and Fig. 16 shows a modification of the flexible turning joint of the auxiliary track for controlling the discharge doors of the excavating buckets.

Preliminary to a detailed structural consideration of the foregoing illustrated embodiments of this invention, it may be pointed out that the opening up of new waterways is, from a practical standpoint, attended with certain peculiar difficulties, particularly when the excavating is done through the instrumentality of an endless series of buckets.

The practice heretofore has been to cause the bucket to be compactly filled at the start or when in its lowermost position. Upon then raising the initially filled bucket it will usually contact with additional matter, which, while incapable of being collected in the already full bucket, will however tend to further compact the material already gathered therein and thereby render the discharge of the bucket difficult, especially when such material is of a sticky and adhesive nature, such as clay. In accordance with the herein described invention, I propose to adjust the slant of the cutting line of the rising excavating chain to conform with the natural slope of the bank undergoing excavation. As a result, such bank will not tend to slip or collapse during the excavation, and its submerged superficial surface will present uniform conditions to the excavating buckets. The latter will then be so brought against the bank that their cutting edges will extend into the bank for a relatively short distance only, and the amount of material accumulated in the buckets will be due rather to the length than to the depth of cut. As a consequence, but slight strains will be imposed upon each bucket, and the wear on the same will be correspondingly greatly decreased. Furthermore, when collected in this way the contents of the buckets will be found to be soft and soggy, because taken from the superficial submerged face of the bank, as contrasted with the compact and relatively dry state of former practices. Because of this peculiar condition, the discharging or dumping of the buckets is greatly facilitated, the material flowing from the bucket without shock and, because of its mushy condition, being well adapted for being subsequently conveyed to a distant point through a suitable chute. Again, in digging a new canal or in enlarging a preëxisting waterway, the excavator must cut its own way, and this involves many practical problems. The excavating should take place progressively and as rapidly as possible, and a positive central anchorage should be insured. Moreover, the cutting portions of the excavator should be so arranged and positioned that other parts of the apparatus will not interfere with a perfect action thereof.

Turning now to the drawings, 1 denotes the boat which carries the various parts of the excavator proper. As the latter will ordinarily be mounted upon the bow of the boat, I propose to balance the whole by mounting the boiler 2, engine 3 and other parts at the opposite end or stern of the boat. In practice the latter portion may also be utilized for the storage of coal and other supplies, and the quarters of the crew may be also arranged so as to equalize the balance of the whole. The bow of the boat, as shown, is provided with a well 4 through which the depending portions of the excavator pass, and to this end such bow may be bifurcated so as to provide right and left hand supports 5 and 6 carrying corresponding parts of the excavator. As will be ob-

vious, variations in this particular may be resorted to, and the length of the well may be only sufficient to provide for the play of the rearward depending truss of the excavator.

The excavator framework may be considered as consisting of two main parts, one stationary and in fixed relation to the float, and the other hinged to the stationary part and movable with relation to the float so as to vary the depth and slope of cut of the apparatus. The stationary frame may be built up of steel or other suitable material, and may provide a forward truss 7 which rises from the beak 8 of the boat and slants upwardly toward its summit 9. A brace truss 10 may extend from the deck 11 of the boat and connect with such summit to stiffen truss 7 and cross pieces 12 may also be provided if desired. The stationary frame is provided in its upper end or apex with an aperture within which is seated a pillow block 13, see Fig. 13, which may be of cast iron, steel or other suitable material. This pillow block, as shown, is of a somewhat peculiar shape, and comprises two annular flanges 14 and 15, which are spaced apart and secured to the steel or sheet metal work frame in the manner shown. The pillow block is also centrally apertured, and extends inwardly to form an annular bearing 16 which serves as a pivot for the hinge 17 of the upper movable truss 18. Suitably carried by the pillow block is a brass 19, which may be of any preferred construction, and within which is revolubly mounted the journaled end of a shaft 20 which transversely extends through the two sides of the stationary framework and preferably protrudes on one or both sides thereof to make provision for carrying an upper wheel or other means for driving the endless excavating belt.

The truss 18 extends from its upper pivot as aforesaid to the deck of the boat and is arranged to swing about its upper end as a center. While it may be entirely supported from its upper pivot, I prefer to provide roller bearings at its lower end so that the strains may be more evenly distributed and excess weight taken from the upper pivot, and to that end I have mounted flanged wheels 21 on the lower end of said truss. These wheels ride along segmental tracks 22, as will be seen by referring to Figs. 1, 6 and 7. Such tracks may be mounted in any desired manner upon the boat, and they may be positioned by means of the shown braces 23 or otherwise as may prove to be most expedient in practice. The segmental tracks are curved to correspond with the upper hinge of the swinging truss as a center, and accordingly the lower end of said truss will be always supported however it be swung about such center.

The depending truss 24 may be hinged to the swinging truss 18 by means of pillow blocks in the same way that the swinging truss is pivoted at its apex to the stationary frame, or I may mount a transverse shaft 25 with its ends journaled to the swinging truss as shown by Figs. 6 and 7. The depending truss 24 may be arranged to swing about shaft 25 as a pivot, and may be provided at its hinged end with a suitable bearing 26 which fits about said shaft.

The construction of the lower end of said depending truss and the manner of connecting it to its companion to form a movable toe, may be best understood by referring to Figs. 8 and 14, from which it will be seen that truss 24 is also provided with a bearing-piece or pillow block 27, which, like the pillow block at the apex, is apertured and is provided with an inner extension 28 adapted to serve as a pivot for the pillow block 29 of the companion truss 30. This arrangement relieves the shaft 31 of undue binding and enables the latter to freely revolve about its bearing 32. The forward depending truss 30 is also hinged at the beak of the boat by means of a pillow block 33 to the stationary rising frame 7.

It will now be understood that the three links 18, 24 and 30 may be moved into different positions, which will be determinable by the location of the rear intermediate hinge of the structure. This moving may be done through any suitable instrumentality, as for example a worm gearing may be driven by the engine 3 whenever desired, so as to displace the said joint into any suitable position. Or I may provide winding drums which receive cables secured either to the movable intermediate joint or to the toe of the apparatus, as may be preferred.

The excavating is preferably done by means of an endless series of buckets or scoops 33 which are connected together at intervals and carried by an endless belt or chain, as shown more clearly by Figs. 1, 9 and 12. When such endless belt is caused to travel around the supporting framework, the buckets will in rotation be brought against the silt or other material which will thus be continuously removed. It will be noted that in the shown embodiment the cutting edge 34 of each bucket constitutes the outermost portion of the same and that, practically speaking, it is only this portion of each bucket that comes in contact with the material to be excavated. One of the important improvements contemplated by this invention resides in making the cutting edges of the buckets of great strength and of material which is hard and durable. To that end the cutting edge forms the extreme portion of a strap 35 which is substantially of a U shaped contour and is preferably so formed as to slant upwardly toward its

outermost cutting edge, which is sharpened or otherwise brought into a shape adapted to cut into the material to be excavated. This strap will preferably be reinforced by means of side plates 36, which may also constitute the sides of the bucket. Ordinarily these plates will be of less thickness than the cutting portion, and such plates may either be integral with the cutting or body portion or they may be separate therefrom and riveted or otherwise securely affixed thereto. Inasmuch as the cutting portion is in usage subjected to much abrasion, and will in some cases become soon worn away, this portion may be so arranged as to permit of being conveniently replaced from time to time. The outer wall or body portion 37 of the bucket may ordinarily be formed of a cheaper grade of material than the wearing parts, and to that end may be of sheet iron or other suitable inexpensive material. This portion of the bucket may be dished in the manner shown, to form a flat outer curved surface with transverse integral sides, which will extend so as to be overlapped by both the cutting lip and the reinforcing side wall. This dished piece may then be riveted or otherwise secured to the lip and to the reinforcing side wall, as will be readily understood.

This invention also proposes to so fashion and arrange the buckets that each will constitute a unit of an endless excavating chain, and to that end, and inasmuch as it is desirable to dispense with all unnecessary parts, the buckets are secured together through extensions 38 of the reinforcing side walls. The extensions from such walls are ogeed and terminate within the succeeding companion bucket. The attachment follows through a shaft 39 which transversely passes through alined apertures in the cutting lip, the underlying reinforcing side wall and the extension from the side wall of the overlying bucket respectively. The construction of each side wall of the bucket is in this respect identical. Although the buckets are by this arrangement all firmly secured together, and are at the same time capable of being readily replaced for the substitution of fresh buckets, it is advisable to provide means for further reinforcing and driving this endless system. To this end this invention proposes to extend the transverse shafts 39 so that they will protrude slightly beyond the sides of the buckets. These shafts are secured to and joined together by means of a chain, which preferably is built up of an alternating series of overlapping single and duplex links 40: that is to say, embracing two of the shafts, at each end thereof will be two parallel links whose ends overlap single links which extend to the adjacent shafts, and the entire system may be built up in this way. Bearing blocks 41 are interposed between each link and its associated shaft.

A feature of practical advantage may here be noted, by referring to Fig. 10 from which it will be seen that the links 40 of the chain are spread intermediate their ends so as to permit the bearing blocks 41 to be removed when worn by merely moving them toward such spread portion which is sufficiently wide to enable such bearing blocks to be removed. Howbeit, this feature is subject to modification within the scope of this invention, and various arrangements of driving means may be resorted to, although the herein shown form possesses many characteristic advantages. An excavating linkage constructed in this way is well adapted for being driven, and carried by a cog-wheel. Such wheel 42 may be formed in accordance with Figs. 10 and 11, and comprises a periphery 43 of polygonal contour, each facet of which is provided with a suitable projection and seat for the corresponding links of the chain. Thus the one facet 44 will have a middle projection 45 with recessed seats 46 on each side thereof, the middle projection being adapted to protrude through the space betwen the two side links of the chain and engage the hinge thereof, and the side recesses being adapted to seat such links. The adjacent facet 47 will on the contrary comprise a central recess 48 for the single link of the corresponding portion of the chain, and two side projections 49 will be provided for positioning the link and engaging the hinge at each end of the link. In order that such wheel may not be unduly clogged by any dirt or other foreign matter which may be carried by the chain, I prefer to depress the projections between the ends in the manner shown, so as to allow a considerable space between the links and the underlying periphery of the wheel. It will of course be understood that in the case shown any even number of facets may be employed to form the periphery of the wheel, and the latter may be of any size and proportions desirable. These wheels 44, to facilitate the turning of the buckets are of considerable diameter, and are disposed in pairs at each hinge of the collapsible framework, being spaced apart and mounted upon shafts 20, 25, 31 and 50, as shown by Figs. 6, 7, 13 and 14. The linkage of the endless train of buckets rides over the exposed peripheries of these wheels, and the length of the train will not undergo variation when the collapsible runway expands or contracts.

One very important feature of my improved system resides in the facility with which the discharging operation may take place, and which to a large extent is due to the peculiar construction and arrangement of the bottoms or inner walls of the buckets.

This inner wall 51 is not fixed and integral with the body of the bucket, but on the contrary is hinged thereto so as to be capable of opening out at the proper time to allow the material in said bucket to escape therefrom. While some little variation in this particular is permissible within the scope of this invention, the shown arrangement is that which I regard as preferable, and consists in hinging the inner wall of the bucket to the inner bottom edge of the same. A simple construction of this hinge consists in turning the material of the outer wall along its edge so as to form a cylinder 52, within which is a suitable shaft 53. Two or more strips 54 of suitable material are provided in their ends 55 with apertures through which this shaft passes, thus constituting a hinge. These strips are preferably secured to the plate 51 which constitutes the inner wall of the bucket, and such strips preferably are also arranged to carry rollers 56 which by running along a suitable track will normally keep the inner walls of the buckets in a closed position. To readily accommodate these rollers, the strips are provided with upturned bearing blocks 57 through which a shaft 58 passes, and at each end of this shaft is mounted a roller as aforesaid, which will preferably be provided with a bearing periphery and a flange adapted to maintain it upon the track.

The means whereby the hinged doors are maintained closed during the major portion of the travel of the bucket to retain the contents, and whereby such doors are allowed to open at a predetermined station to discharge the contents, will be better understood by referring to Figs. 1, 6, 7, 8 and 12. Each of the trusses carries a section of the auxiliary track 59, which is positioned quite closely to the body of the bucket and serves as a runway for the rollers 56 of the door so that the latter will be held closed, besides affording an auxiliary support for guiding and steadying the endless train of buckets.

Each joint of the collapsible framework is provided with arc-shaped supports 60 which are preferably loosely mounted on the joint shafts 20, 25, 31 and 50 and maintained against rotation therewith by any desired means, such as an attachment to one of the track ends. The track 59 rounds over these supports and, to provide for the pivoting of the trusses, is provided with a suitable expansion joint 61 at each turning point. Such joints may be had by dividing the track so as to form mortised overlapping ends, as will be understood. Or the modification shown by Fig. 16 may be resorted to, in which 62 represents a wheel loosely carried by the joint shaft and 63 the track ends, which are arranged flush and tangential with such wheel so that the door rollers may readily ride over the wheel. At the apex of the framework the railway for the rollers of the hinged sides of the buckets is curved, and follows a path sufficiently below the upper periphery of the turning wheel to permit the lips of the buckets to open and discharge the debris, as illustrated in Fig. 12. When, therefore, the bucket approaches the apex of the frame the rollers of the flap travel along their track, which begins to diverge away from the toothed linkage, and as will be readily understood the flap then begins to open, and finally assumes a substantially vertical position so as to discharge all the material in the bucket. As the bucket then progressively continues its travel the flap will begin to close and will finally be brought into a closed state.

In order that the falling debris may be properly collected this invention proposes a funnel-shaped hopper 64 having discharge outlets 65. The outlets extend to either side of the framework, and as will be understood may be used simultaneously to spread the debris along each bank of the canal as it is being cut, or but one of these outlets may be used at a time and the debris may be spread along one of the banks, according to the preference of the operator.

To enable the debris to be discharged at a distance from the sides of the framework this invention proposes a conveyer pipe 66 which is provided with a series of collars 67 spaced apart at suitable intervals, and to these collars are secured a number of cables 68 which converge toward the point of suspension 69, which is preferably a small carriage 70 arranged to travel along a horizontal track 71 provided by a suitable transverse crane 72. This crane preferably extends to either side of the vertical support, and is pivoted at its middle to a standard 73 which rises from the top of the vertical frame, and such standard at its top has a pivoted cap 74 from which radiate a number of tension cables 75 extending into attachment with suitable portions of the horizontal part of the crane. The weight of the conveyer tube may be equalized by means of a stay 76 fixed to the outer end of the horizontal crane and extending to a suitable traveler 77 guided by a segmental track 78, as will be readily understood from Figs. 2 and 15.

For the purpose of positioning and steadying the boat during the dredging, this invention provides the boat with means for inserting and removing one or more piles or like anchoring means about which the boat may be oscillated so as to cause the excavating chain to swing back and forth and to progressively remove arc-shaped portions of the bank.

Turning to Figs. 1 and 3, it will be seen that the boat carries two small derricks 79 and 80. These derricks are preferably

spaced apart on each side of the center line of the boat, and they may be located at any portion of the boat, either at or intermediate the ends thereof, as shown by the said figures. Underlying the apex or sheave 81 of each derrick is a tubular well 82 through which the associated pile 83 may have a vertical movement, and preferably each well is of a sufficient length to prevent an oscillation in a vertical plane of the contained pile. A rope 84 will pass from the upper end of the pile over the sheave and thence to any suitable hoisting mechanism. In lieu of these derricks any other suitable means for raising or lowering the piles may be resorted to within the scope of this invention. It will now be understood that the boat may be oscillated about either one of these piles, thereby causing the prow or cutting portion thereof to describe an arc and remove a corresponding layer of the embankment in advance of the boat. As soon as the boat has described an arc of the desired length and reached the turning point, which will be on that side containing the embedded pile which acts as a pivot, the more distant pile may be embedded and the first mentioned pile then withdrawn. Upon returning the boat about the newly embedded pile, it will be seen that another arc-shaped layer will be removed from the embankment in advance of the boat, and the latter will at the same time progress slightly, depending upon the distance between the two piles. Thus through the alternative employment of each of these piles, the boat will be caused to progressively advance step by step and at the same time remove any desired width of the embankment ahead of the boat. The advance of the excavator may also be brought about by hawsers affixed to the banks, and other means for the same purpose may be resorted to if desired.

It will thus be seen, without further elaboration, that the disclosed invention is one well adapted to attain the ends and objects hereinbefore pointed out. An excavator made in accordance with this invention will be found to be durable and efficient, and capable of being constructed at a cost which, considering the nature of the work it will perform, will be relatively small. In carrying out this invention some parts might be employed without others and the new features thereof may be combined with elements old in the art, although the herein described type is regarded as the preferred one, and as being a substantial improvement over many of such obvious or implied variations or arrangements.

As many changes could be made in the above construction and many apparently widely different embodiments of this invention could be made without departing from the scope thereof, it is intended that all matter contained in the above description or shown in the accompanying drawings shall be interpreted as illustrative and not in a limiting sense. It is also to be understood that the language used in the following claims is intended to cover all of the generic and specific features of the invention herein described and all statements of the scope of the invention, which, as a matter of language, might be said to fall therebetween.

Having described my invention, what I claim as new and desire to secure by Letters Patent is:

1. An excavating apparatus comprising in combination a plurality of trusses hinged together to form a collapsible polygonal framework, one of said trusses being stationary, and an endless train of excavating buckets mounted to travel around said framework.

2. An excavating apparatus comprising in combination a collapsible framework comprising a plurality of hinged trusses, one of said trusses being immovable and providing at each end a fixed pivot about which another of said trusses may swing, and an endless train of excavating buckets mounted to travel around said framework.

3. An excavating apparatus comprising in combination a stationary derrick, a pair of depending trusses pivoted at the upper and lower ends of said derrick respectively, an inextensible link hinged to and connecting the free ends of said trusses, and an endless excavating chain mounted to travel around the periphery of the aforesaid parts.

4. An excavating apparatus comprising in combination a plurality of trusses hinged at adjacent ends to form a collapsible polygonal framework, one of said trusses being immovable and forming a stationary derrick and extending upwardly, and an endless excavating chain mounted to travel around said framework and discharge debris near the summit thereof.

5. An excavating apparatus comprising in combination a plurality of trusses hinged at adjacent ends to form a collapsible polygonal framework, one of said trusses being stationary and slanting upwardly and terminating to form a fixed apex about which a companion truss may swing, and an excavating chain mounted to travel around said framework.

6. An excavating apparatus comprising in combination a plurality of trusses hinged together at their adjacent ends to form a collapsible polygonal framework, the apex and foot of one of said trusses being fixed in position and adapted to serve as pivots about which companion trusses may swing to raise or lower the toe of said framework, and an endless train of excavating buckets mounted to travel around said framework.

7. An excavating apparatus comprising in combination a float, a stationary derrick carried thereby, a truss pivoted to swing from the apex of said derrick, depending trusses hinged to the lower portions of said swinging truss and said derrick respectively and converging to form a toe, and an endless chain of buckets mounted to travel around the aforesaid framework, whereby upon swinging said swinging truss the toe of said framework may be raised or lowered to excavate at different depths.

8. A collapsible polygonal framework comprising two upper trusses converging toward a fixed apex, one of said trusses being immovable and the other being adapted to swing about said apex, a segmental track supporting the lower end of said swinging truss, and a pair of depending trusses converging toward a hinged toe, the one being hinged and depending from said swinging truss and the other from said immovable upper truss.

9. A collapsible polygonal framework comprising a pair of upper trusses converging toward a fixed apex, and a pair of lower depending trusses converging toward a movable toe, one of said upper trusses being hinged to swing about said apex and the other being immovable, a segmental track arranged to carry the lower end of said swinging truss, and a train of excavating buckets mounted to travel around said framework to gather material at the bottom thereof and discharge the same at the fixed apex.

10. An excavating apparatus comprising in combination a float, a collapsible polygonal framework mounted on said float at one end thereof and with the lower portion of said framework submerged, means for expanding or collapsing said framework to raise or lower the toe thereof, and an excavating means arranged to remove debris from a point adjacent said toe and discharge the same at a point overlying said float.

11. An excavating apparatus comprising in combination a vehicle, a collapsible polygonal framework carried by said vehicle on the bow thereof, said framework providing a fixed point of discharge, and an endless excavating belt mounted to travel around said framework and discharge debris at said point.

12. An excavating apparatus comprising in combination a boat, a collapsible polygonal framework carried by said boat on the bow thereof and composed of a plurality of inextensible hinged links or trusses forming the sides of the polygonal framework, one of said trusses rising from the beak of said boat, whereby said framework may be collapsed or expanded without varying the length of its periphery, and an endless excavating chain mounted to travel around said constant periphery.

13. An excavating apparatus comprising in combination a vehicle, a plurality of trusses supported by said vehicle and converging upwardly to form an apex, one of said trusses being adapted to swing about said apex as a center and another being immovable and rising from the extreme end of said vehicle, and an endless excavating belt mounted to travel along said trusses.

14. An excavating apparatus comprising in combination a vehicle, a plurality of trusses carried thereby, one of said trusses rising from the extreme end of said vehicle and converging upwardly with another toward an apex, said apex being fixed in position relatively to said vehicle and one of said trusses being adapted to swing about said apex as a center, and an endless excavating belt guided in its travel by said trusses.

15. An excavating apparatus comprising in combination a vehicle, a plurality of trusses carried thereby, one of said trusses rising from the extreme end of said vehicle and converging upwardly with another to form an apex, one of said trusses being arranged to swing about said apex as a center, a segmental track carried by said vehicle and supporting the lower ends of said swinging truss, and an endless excavating chain mounted to travel around the periphery of said trusses.

16. An excavating apparatus comprising in combination a vehicle provided with a well coinciding with the longitudinal center and located in the forward end of said vehicle, a collapsible polygonal framework arranged partly in said well and having portions extending above and below said well, said framework comprising two links hinged together, said hinge being adapted to be displaced into different positions relative to said vehicle, whereby the collecting portions of an excavating means may be raised or lowered, and an endless excavating means mounted to travel around the periphery of said framework.

17. An excavating apparatus comprising in combination a vehicle, a pair of trusses converging upwardly to form an apex, one of said trusses being hinged at said apex and adapted to swing thereabout, a track carried by said vehicle upon which the lower end of said swinging truss is supported, a pair of depending converging trusses, the one being hinged to the lower end of said swinging truss and the other to said vehicle, and an excavating means adapted to be guided in its travel by said trusses and arranged to discharge material in proximity with the apex.

18. An excavating apparatus comprising

in combination a vehicle, a pair of trusses carried thereby and converging to form an upper hinged joint about which one of said trusses may swing, a segmental track arranged to support the lower end of said swinging truss, said track having a curvature inscribed by the bearing end of the swinging truss, a pair of swinging trusses hinged together at their lower ends to form a toe, the one truss being hinged to the forward end of said vehicle and the other to the free end of said swinging truss, and an excavating means mounted to travel around said trusses and discharge material adjacent the upper hinged joint thereof.

19. An excavating apparatus comprising in combination a vehicle, a stationary framework carried thereby and rising from the extreme end thereof, a collapsible framework comprising a truss pivotally swung from an upper fixed pivot provided by said stationary framework, and an endless excavating chain mounted to travel around the periphery of said framework and discharge material adjacent said upper pivot.

20. An excavating apparatus comprising in combination a vehicle, a stationary framework rising from the extreme end thereof, a swinging truss converging toward the summit of said stationary framework and pivoted thereto, the lower ends of said swinging truss and said stationary framework being connected by a plurality of hinged trusses arranged to provide a lower toe, whereby upon swinging the lower end of said swinging truss said toe may be raised, and a train of excavating buckets mounted to travel around said framework.

21. An excavating apparatus comprising in combination a vehicle provided with an elongated well in its forward end, a segmental track rising at each side of said well, the radii of said tracks centering at a point overlying said well and to the rear of the extreme end of said vehicle, a swinging truss having a lower end arranged to travel upon each track, a truss hinged to and depending from the lower end of said upper trusses, a companion truss hinged to the end of said vehicle, said depending trusses converging to form a hinged toe which may be raised by moving the lower end of said swinging truss, and an endless train of excavating buckets mounted to travel around the periphery of said trusses.

22. An excavating apparatus comprising in combination a vehicle, a collapsible diamond-shaped framework carried thereby, one of the intermediate joints of said framework being adjustably mounted on said vehicle and the other affixed to the end thereof, whereby the former may be moved relative to the latter to raise or lower the toe of said framework, and an endless excavating chain mounted to travel around the periphery of said framework.

23. An excavating apparatus comprising in combination a vehicle, a plurality of trusses hinged to form a collapsible diamond-shaped framework, a curvilinear track carried by said vehicle and arranged to support one of the intermediate hinges of said collapsible framework, the other being affixed to the extreme end of said vehicle, whereby the former may be retreated to raise its toe, and an endless excavating chain mounted to travel around said framework.

24. An excavating apparatus comprising in combination a vehicle, a plurality of trusses hinged at meeting ends to form a diamond-shaped collapsible framework, a segmental track whose center of curvature is the apex of said framework, the rearward intermediate joint of the latter being arranged to travel along said track to raise or lower the toe of said framework, the forward intermediate joint being affixed to said vehicle, and a train of excavating buckets mounted to travel around the periphery of said framework.

25. An excavating apparatus comprising in combination a boat, a collapsible polygonal framework arranged to coincide with the longitudinal axis and carried by the bow of said boat, the upper end of said framework being fixed and serving as a pivot about which one of the depending members of said framework may be swung, the other depending member constituting a stationary framework carried by said vehicle and serving as a support for said upper pivot, said stationary framework rising from the beak of said boat.

26. In excavating apparatus, in combination, an excavating bucket comprising a body portion having a wall provided with a cutting edge, and a swinging discharge door hinged to said body portion and located opposite said wall, a runway causing said bucket to travel in a predetermined path, and an auxiliary runway for holding said door closed during the major portion of the travel of said bucket and permitting said door to open at a predetermined station.

27. An excavating apparatus comprising, in combination, a frame work, and an endless excavator mounted to travel around said frame work, said excavator comprising a series of buckets, one of the walls of each of said buckets being provided with an extension whereby said bucket is pivotally connected to the succeeding bucket.

28. An excavating apparatus comprising, in combination, a frame work, and an endless excavator mounted to travel around said frame work, said excavator comprising a

series of buckets, the side walls of each of said buckets being provided with extensions whereby said bucket is pivotally connected to the succeeding bucket.

29. In excavating apparatus, in combination, an excavating bucket comprising a body portion having a wall provided with a cutting edge, a discharge door opposite said wall, said door being hinged to said body portion of the bucket at its lower end, a runway causing said bucket to travel in a predetermined path, and an auxiliary runway for holding said door closed during the major portion of the travel of said bucket and permitting said door to open at a predetermined station.

30. An excavating apparatus comprising in combination a collapsible framework comprised of a plurality of hinged trusses, one of said hinges consisting of an apertured block affixed to one of said trusses and providing a bearing serving as a pivot for the companion truss, and a shaft revolubly mounted within the aperture of said block.

31. An excavating apparatus comprising in combination a collapsible framework, a chain adapted to travel around said framework, a bucket carried by said chain, the side of said bucket adjacent said chain being provided with a hinged door adapted to be opened to discharge the contents of said bucket, and a runway maintaining closed said door while said bucket is conveying material to the discharge point.

32. An excavating apparatus comprising in combination a collapsible polygonal framework, a chain adapted to travel around said framework, buckets carried by said chain and radiating from said framework, and a hinged door on the side of each bucket adjacent said chain, whereby the contents of said bucket may be discharged at a predetermined station.

33. An excavating apparatus comprising in combination a vehicle, a collapsible polygonal framework having at each joint thereof a turning wheel, an endless chain mounted to travel around said wheels, one of said wheels being adapted to drive said chain, excavating buckets carried thereby, and means for discharging the contents of each bucket at a point fixed relatively to said vehicle, a chute for receiving and conveying the contents of said buckets, and an overlying crane for carrying said chain, whereby it may be freely moved into diverse positions to deliver said contents at any predetermined point.

34. An excavating apparatus comprising in combination a jointed runway, turning wheels at each joint thereof, an endless series of connected excavating buckets, an endless chain also attached to said connected buckets and carried by said wheels, and means for driving said chain to propel said connected buckets.

35. An excavating apparatus comprising, in combination, a traveling chain, certain of the links of said chain being spread intermediate their ends, a bearing block seated in the crotch formed by the ends of each of said links and adapted to be disengaged by moving it toward the spread portion of said link, and an excavating bucket secured to each block.

In testimony whereof I affix my signature, in the presence of two witnesses.

THOMAS F. LONNEY.

Witnesses:
ARTHUR G. PREVIN,
H. M. SEAMANS.

872

[Fourth Edition.]

A.D. 1864, 4th *May*. N° 1124.

Artificial Stone.

LETTERS PATENT to John Potter, of the City of Manchester, Civil and Consulting Engineer, for the Invention of "**A New Compound or Composition for Artificial Stone, and for certain Machinery or Apparatus to be used in Mixing and Applying the said Composition.**"

Sealed the 28th October 1864, and dated the 4th May 1864.

PROVISIONAL SPECIFICATION left by the said John Potter at the Office of the Commissioners of Patents, with his Petition, on the 4th May 1864.

I, John Potter, of the City of Manchester, Civil and Consulting Engineer, do hereby declare the nature of the said Invention for "**A New Compound or Composition for Artificial Stone and for certain Machinery or Apparatus to be used in Mixing and Applying the said Composition,**" to be as follows:—

The first part of my Invention consists in forming or producing a certain description of artificial stone by the admixture of siliceous sand with a certain proportion of metallic iron in a state of comminution. The proportion of the metallic iron to the sand may be in the ratio of from 3 to 10 parts or more of iron powder to 100 parts of sand by measure; but the quantity of iron powder required will depend upon its fineness and also upon the purity of the sand; generally the finer the iron powder is the smaller the quantity of it will be sufficient. The proportionate quantity of the two ingredients will also depend on the purpose to which the artificial stone is to be applied. As a general rule the harder the artificial stone is required to be, and the larger

[Fourth Ed.]
PRICE 1/-

the quantity of the iron powder in proportion to the sand will be necessary. Borings or turnings of iron, when sufficiently fine, will answer the purpose of the iron powder here mentioned.

The second part of my Invention consists in the formation of sea walls (in particular) of the artificial stone, or facing embankments formed of earth with the same, and also artificial foundations for buildings or erections, also forming the same into blocks for building and other purposes, or pieces of a variety of forms, by casting the same in moulds, and thus giving the finished piece any shape that may be required. After the composition is mixed it is necessary that it should be moistened with water, which will in general be best done after the composition is in the mould, or form, or place wherein it is to take its shape. Water containing a quantity of common salt or sal ammoniac will in general be found to be advantageous for this purpose.

The third part of my Invention relates to apparatus for conveying the materials from place to place and mixing the same. The conveying apparatus consists in applying tubes or pipes combined with other apparatus. The continuous tube being placed at a certain inclination the materials are elevated by other apparatus, and discharged into the upper end, they then flow down the tube to their destination. The mixing apparatus consists of two funnels, into one of which the siliceous sand is placed, whilst the iron powder is placed in the other. As the materials descend from the funnels they are measured by means of slides or stops, the slides or stops acting simultaneously in descending pipes or tubes. The two pipes discharge the materials into one, after which they pass or are placed in the compounding apparatus, in which they are more perfectly mixed by being stirred or agitated together. The compounding apparatus consists of a hollow cylinder open at each end, placed in an inclined position and revolving on an axis. The composition enters the hollow cylinder at the upper end, and is discharged at the lower end.

The fourth part of my Invention consists in the application and adaptation of certain apparatus or means to the purpose of facilitating the application of the artificial stone to useful purposes. I construct boxes or cassoons of wood or metal of a suitable size or form. Into these the mixed materials are poured, and being wetted as before mentioned, are left to harden into a solid mass. I also apply the artificial stone as a substitute for piles of wood or iron, this I effect by means of tubes, at one end of which is a loose tip or point. The tube being driven into the earth (with the point foremost) a sufficient depth, the tube is filled with the composition, the tube being then withdrawn, the loose tip is left in the earth, and the hole as the tube is withdrawn becomes filled with the composition, which being wetted hardens in the usual manner.

In certain cases, however, instead of extracting the tube I leave it in the earth, and the same also with the cassoons formed of wood or metal.

The fifth part of my Invention consists in producing the iron powder directly from certain ores or oxides of iron, which are naturally or may be reduced to the state of powder; this powder being mixed with a proportionate part of carbonaceous matter, and exposed to heat in a retort or other suitable vessel, will give the iron powder required.

SPECIFICATION in pursuance of the conditions of the Letters Patent, filed by the said John Potter in the Great Seal Patent Office on the 3rd November 1864.

TO ALL TO WHOM THESE PRESENTS SHALL COME, I, JOHN POTTER, of the City of Manchester, Civil and Consulting Engineer, send greeting.

WHEREAS Her most Excellent Majesty Queen Victoria, by Her Letters Patent, bearing date the Fourth day of May, in the year of our Lord One thousand eight hundred and sixty-four, in the twenty-seventh year of Her reign, did, for Herself, Her heirs and successors, give and grant unto me, the said John Potter, Her special licence that I, the said John Potter, my executors, administrators, and assigns, or such others as I, the said John Potter, my executors, administrators, and assigns, should at any time agree with, and no others, from time to time and at all times thereafter during the term therein expressed, should and lawfully might make, use, exercise, and vend, within the United Kingdom of Great Britain and Ireland, the Channel Islands, and Isle of Man, an Invention for "A NEW COMPOUND OR COMPOSITION FOR ARTIFICIAL STONE AND FOR CERTAIN MACHINERY OR APPARATUS TO BE USED IN MIXING AND APPLYING THE SAID COMPOSITION," upon the condition (amongst others) that I, the said John Potter, my executors or administrators, by an instrument in writing under my, or their, or one of their hands and seals, should particularly describe and ascertain the nature of the said Invention, and in what manner the same was to be performed, and cause the same to be filed in the Great Seal Patent Office within six calendar months next and immediately after the date of the said Letters Patent.

NOW KNOW YE, that I, the said John Potter, do hereby declare the nature of my said Invention, and in what manner the same is to be

performed, to be particularly described and ascertained in and by the following statement and accompanying Drawing (that is to say):—

My Invention consists, first, in the application and adaptation of a new compound or composition for forming or producing a certain description of artificial rock or stone.

The second part of my Invention consists in the application of the artificial stone to the purposes of constructing sea walls (in particular); also constructing, facing, or strengthening embankments; also forming artificial foundations for buildings and other erections; also for forming the same into blocks for building and other purposes.

The third part of my Invention consists, first, in the application and adaptation of certain machinery to the purpose of conveying the materials from place to place; second, in the application and adaptation of certain machinery to the purpose of apportioning and measuring the respective quantities of the several materials; third, in the application of certain machinery to the purpose of mixing, combining, and compounding the different materials.

The fourth part of my Invention consists in the use and application of boxes or caissoons, for the purpose of giving to the artificial stone a particular shape or form, or retaining it during the process of hardening. I also use these boxes or caissoons in certain cases to retain permanently the artificial rock. I also use the artificial rock as a substitute for piles which are usually made of wood or iron.

The fifth part of my Invention consists in producing the iron powder directly from certain ores or oxides of iron.

In order to make my Invention more clearly understood, I have hereunto annexed a Sheet of Drawings, to which the following description relates, and in which the same letters or figures of reference, or letters and figures conjoined indicate the same parts.

The compound or composition of artificial stone or rock, constituting the first part of my Invention, I produce as follows:—I procure siliceous sand (of which river sand and sea sand are the best natural specimens), and metallic iron in the state of powder. Borings, turnings, filings, or other remnants of cast or wrought iron, when sufficiently fine, answer the purpose of the iron powder; but I also produce the iron powder from certain ores or oxides of iron. The proportions of the two ingredients may be varied, but in general fourteen part of siliceous sand to one of iron powder, by measure, or ten parts of siliceous sand to one of iron powder, by weight, will form an efficient composition for most purposes to which the artificial stone can be

applied: but these proportions may be varied, and in general the more the quantity of the iron powder, the harder the resulting artificial rock will be. A certain amount of other materials or impurities may be admitted into the composition according to the purpose to which the artificial stone is applied. The ingredients being well mixed together and moistened with water, become converted in a short time into artificial rock.

The second part of my Invention relates to certain applications of the artificial stone or rock. First in the formation of sea walls or embankments to fence out the sea, or the strengthening of such structures. For this purpose I make use of the sand hills and other accumulations of sand on the sea shore: this I mix with the iron powder as before described. If the wall is to be constructed entirely of the artificial rock, I first construct a caissoon or chamber of slabs or other inferior timber or material, and fix the same on a spot where the wall or a portion of it is to be erected. The caissoon is then to be filled with the composition of sand and iron powder before described. The composition may be wetted with water before being placed in the caissoon, or it may be put in in a dry state, (which will in many cases be most convenient), and afterwards wetted or left to be moistened by rain or water from other natural sources.

Another mode of constructing sea walls (which in general I prefer) is as follows:—I build a slight wall of some harder material, which I support by placing behind it a mass of the artificial rock. This will be understood from Figs. 5 and 6, in which Fig. 5 represents a section, and Fig. 6 a plan.

A, A, slight wall of some hard material; B, B, mass of artificial rock supporting the wall. The composition is to be confined by a hoarding or other means, until it is sufficiently set to support itself and the wall without assistance. Second, embankments formed of earth I secure by coating them with the artificial rock, the thickness of which must be regulated by circumstances, and which may be two, three, or more feet. The external surface of the coating may afterwards be indurated as will be more particularly explained hereafter.

Another mode of strengthening embankments formed of earth is shewn in section in Fig. 7, which is also applicable to embankments already made. In this case I form a trench through the embankment lengthwise, of a proper form and dimensions, and fill it with the composition, which being wetted hardens into rock; C, C, the earth forming the embankment; D, D, the artificial rock. The trench may in many cases be made in the form of a curve, so that the artificial rock will constitute an arch supported on abutments at each termination of the embankment.

Third, in making artificial foundations, the process of which is simply making an excavation of sufficient dimensions, and of a depth corresponding to the weight of the erection to be placed upon it. The depth may consequently vary from one foot to six feet or more, according to the weight or pressure of the superstructure, and is to be filled with the composition in the manner before described. If a very heavy erection is to be placed on a foundation, it will be advantageous to insert in the composition long and thin strips of iron, which will greatly add to its tenacity and strength.

Fourth, for forming blocks of artificial stone, I provide boxes or moulds of the dimensions and shape required. These are filled with the composition in the manner already described, and left to harden a sufficient time. A ready and cheap mode of effecting the same is as follows:—I prepare a model of the proposed block, I then dig a hole in the earth in which I place the model, and ram the earth firmly round it; the model is then withdrawn, and the space filled with the composition, which is then slightly covered with earth and left to harden. In this manner a single model will answer the purpose of forming moulds for an immense number of blocks.

The third part of my Invention relates to machinery for conveying, apportioning, and compounding the materials. Fig. 1 represents a side view of the conveying apparatus; E, E, a tube of metal or other suitable material placed in an inclined position, and supported by scaffolds F, F, &c. The materials are elevated and discharged into the upper end of the tube E, E, down which they pass, and are discharged at the lower end at the place required. A convenient mode of elevating the materials is shewn in the Figure, where E1 represents a moveable elevating tube turning on a centre E2, fixed on the scaffolding. On the tube E1 being elevated into the position shewn by dotted lines, it becomes connected to the tube E, E, forming one continuous tube. The other end of the tube E1 is furnished with a funnel, into which the materials are placed. When the distance to which the materials are to be conveyed is considerable, it will be necessary that the lower end of the tube E, E, should discharge the materials into a funnel at the end of another elevating tube similar to the one shewn at E1; this last discharges the materials into another tube similar to E, E; and the process of conveying the materials may thus be continued to any extent that may be required. The inclination of the tubes will depend greatly on their smoothness inside: the smoother the interior is the less inclination will be required.

Fig. 2 represents a side elevation of one mode of constructing the apportioning apparatus. G, a funnel or hopper in which the sand is to be placed; from this descends the tube or pipe G1, G1; in this tube work the two slides G2

and G3. H, another smaller funnel or hopper in which the iron powder is placed; from this descends the tube or pipe H1, H1; in this tube works the two slides H2 and H3. The two slides G2 and H2 are actuated by means of connecting rods from the lever I, turning on the centre I1, and the two slides G3 and H3 are actuated by means of connecting rods from the lever J turning on the centre J1. The lever I has a lower arm I2, and betwixt this lower arm and the lever J plays the upper end of the lever K, turning on the centre K1. To the lever K, a reciprocating motion being given, it acts alternately (by this arrangement) on the levers I and J. When it acts on the lower arm I2, of the lever I, the slides G2 and H2 are withdrawn from the tubes G1 and H1, the portion of the tube G1, above the slide G3, becomes filled with sand, and the portion of the tube H1, above the slide H3, becomes filled with the iron powder. On the reverse motion of the lever K, the slides G2 and H2 are allowed to close, and the slides G3 and H3 are withdrawn from the respective tubes, and the sand and iron powder descend into the funnel or hopper L, from which they are conducted to the compounding apparatus, in which the ingredients are more perfectly mixed together. The slides when not withdrawn by the action of the lever K, are closed by means of a worm or other spring (not shewn in the Drawing) connecting the arm I2 with the lever J. A vibratory motion is communicated to the lever K by any adequate power. The proportionate quantities of the two ingredients will depend on the relative capacities of the tubes G1 and H1.

Another apparatus to be used for the same purpose is shewn in Fig. 3. In this construction the slides are dispensed with, and wheels or drums having vanes or buckets upon them are substituted instead; G, the funnel or hopper in which the sand is placed; G1, G1, the pipe or tube descending from the same; H, the funnel or hopper in which the iron powder is placed; H1, H1, pipe or tube descending from the same; L, the funnel or hopper which receives the combined ingredients from the pipes G1 and H1. These parts are respectively the same as those shewn in Fig. 2. G4, a wheel or drum furnished with vanes or buckets and turning on axis; it works in a box or case attached to the tube G1, G1, and forming part of it. The sand descending through the pipe G1, G1, enters the buckets of the drum G4, giving motion to it, and is discharged from it into the lower part of the tube G1. H4, a similar drum working in a case or box attached to the tube H1, H1. The iron powder descending the tube H1, H1, fills the buckets of the drum H4, and from thence is discharged into the lower part of the tube H1. From the lower orifices of the tubes G1 and H1 the ingredients are discharged into the hopper or funnel L, or other receptacle, from whence they are conveyed

to the compounding apparatus. A pulley or drum is fixed on the axis of the drum G4; this pulley gives motion to the drum H4 by means of a strap or band which passes over another drum or pulley on the axis of the drum H4. The relative velocities of the two drums G4 and H4 (and consequently the relative quantities of the two ingredients delivered) will be regulated by the relative sizes of the two band pulleys or drums, and by varying the respective sizes of these pulleys or drums the proportionate quantities of the two ingredients may be regulated to any degree of nicety which may be required. The same results will obviously be produced by using toothed wheels instead of these pulleys or drums. The working velocity of the apparatus may be regulated by means of a brake or fan, or by being connected to some moving power. If it should be required to add a third ingredient, another funnel with its descending tube and appurtenances may be added to the apparatus, and so on.

Fig. 4 represents a side view (shewn partly in section) of the mixing and compounding apparatus. M, M, two end frames which support the moving parts; N, N, axis, supported in an inclined position, and turning in bearings attached to the end frames M, M, N1, N1, a hollow cylinder attached to the axis N, N, by means of rings furnished with internal arms. The interior of the cylinder may be furnished with a number of small vanes which will facilitate its action on the materials. N2, driving pulley or wheel, by which motion is communicated to the axis N, N. N3, N3, two discs, fixed on the axis N, N, and revolving with it; the use of which is to prevent the materials getting into the bearings and abrading and destroying the rubbing surfaces. O, a hopper furnished with a descending tube, into this the materials are placed and are conducted by the descending tube into the interior of the upper end of the cylinder N1, N1, by the rotation of which they are effectually mixed and compounded together, which being effected they fall out of the cylinder at its lower end on to the floor or into a receptacle prepared to receive them. The inclination of the axis N, N, is to be regulated so that the ingredients may be properly mixed without being too long detained in the interior of the cylinder. To render the above machines fully effectual it will be proper that the materials should be in a dry state.

The fourth part of my Invention relates, first, to the application and adaptation of boxes or caissoons, made of various shapes or forms as may be required, they may be constructed of wood or metal, and being filled with the composition (kept in a moist state a sufficient length of time), a block of artificial stone is produced, which being removed from the caissoon, and indurated when necessary, is ready for use. I also use the caissoons filled with the artificial rock in certain cases where it is required to have blocks or masses of the

artificial rock applied so as to act by their weight as well as by their size or strength. In this case the caisson is not removed, but remains as an external covering to the artificial rock. Second, I apply the artificial stone as a substitute for piles of wood or metal in the following manner:—

Figs. 8 and 9 represent the apparatus shewn principally in section. P, P, a tube of metal, at the lower end of which is the loose tip Q. The tube P, P, is constructed in lengths, which can be coupled together when required; R, a bracket fixed across the interior of the lowermost length of the tube. The tube is to be driven a sufficient depth into the earth, when this is effected a hook of a proper construction attached to a rope or chain is lowered down the interior of the tube, so as to take hold of the bracket R; by this means the metal tube is to be withdrawn out of the earth, previous to which a quantity of the artificial stone composition is to be poured into the interior of the tube, and as the tube is being withdrawn fresh quantities of the composition are to be supplied. When the tube is therefore wholly withdrawn the space previously occupied by it will be filled with the composition, which in time will be converted into artificial stone. The loose tip Q is by this operation left in the earth and serves as a foundation on which the pile rests. In some cases it will be desirable to leave the tube itself in the earth.

Fig. 10 represents a section of an artificial foundation resting on piles as above described; S, S, S, S, piles of the artificial stone; T, T, mass of the artificial rock resting on the piles. On this mass the building or erection is to be constructed.

The fifth part of my Invention relates to the production of the metallic iron powder directly from certain ores of iron, (such as the hematites, martial pyrites, or the same after a portion of the sulphur has been extracted or such others as may be sufficiently rich in iron) or oxides of iron (such as the black and red oxides) produced in various processes in the arts. If the ore or oxide is not naturally in a state of powder it will have to undergo the process of grinding. The powdered ore or oxide is next to be mixed with as much carbonaceous matter as will reduce it to the metallic state. This will vary according to the nature of the ore or oxide under process, but in general, one-tenth to a fifth part of absolute carbon in the carbonaceous matter will be sufficient. Generally, mixtures of the ores and oxides will be advantageous, as by a judicious apportioning and selection of them a less quantity of carbonaceous matter will be required, and the process of reduction accomplished with greater economy. The addition of a quantity of flux (such as carbonate of lime) will in most cases be advantageous. The mixture is next to be exposed to heat for three or four hours in a retort or other suitable vessel. The heat

should be gradually raised, but should not be raised so high as to melt the iron. Different ores and oxides of iron will however require variations in the treatment in order to bring them to a metallic state, but these variations being well known to metallurgists need not be further mentioned here. The mass being allowed to cool will be the metallic iron powder required, mixed with some amount of impurity, which, however, if the process has been well conducted will not be injurious. Instead of using water for the purpose of moistening the composition, a solution of common salt or sal-ammoniac will be advantageous to hasten the process of conversion. A solution of copperas (sulphate of iron) is however the best which I have so far been able to discover for this purpose. When the artificial stone is once formed, and it is requisite that it should be indurated to resist the effects of the atmosphere and attrition, quicklime in the state of solution, or milk of lime may be applied to it with good effect, as also other stone preserving applications. A certain amount of impurities may also be admitted into the composition, but generally with injurious effect. However carbonate of lime in the state of powdered limestone, powdered chalk, or whiting may be used for some purposes with good effect to the extent of one-tenth part or more of the whole or thereabouts; but the application of these substances is to be regarded simply as adventitious and as forming no part of my present Invention.

Having thus described the nature of my Invention, and the manner in which the same is to be performed, I would have it understood that I do not confine myself to the precise details of construction and arrangement of the mechanism and apparatus herein described, as these may be varied, but that what I claim as new and of my Invention is as follows:—

Under the head of the first part of my Invention I claim, the application and adaptation of a combination of siliceous sand and metallic iron in the state of powder (into which combination other materials may be admitted to a certain extent) for the purpose of producing artificial stone or rock as herein described.

Under the head of the second part of my Invention I claim, first, the application and adaptation of the artificial rock or stone to the purpose of constructing sea walls and embankments to fence out the sea (in particular); also constructing, facing, or strengthening embankments in general: second the application and adaptation of the artificial rock or stone to the purpose of forming artificial foundations for buildings and other erections: third, the application and adaptation of the artificial stone or rock to the purpose of forming blocks for building and other purposes, as herein set forth and described.

Under the head of the third part of my Invention I claim, first, the application and adaptation of the conveying apparatus shewn in Fig. 1; second, the application and adaptation of the opportioning apparatus shewn in Figs. 2 and 3; and, third, the application, and adaptation of the compounding apparatus shewn in Fig. 4 as herein set forth and described.

Under the head of the fourth part of my Invention, I claim, first, the application and adaptation of boxes or caissons for the purpose of giving various shapes or forms to the artificial stone or rock, or permanently retaining the same; second, the application and adaptation of the artificial rock or stone as a substitute for piles of wood or metal and the apparatus for applying the same as shewn in Figs. 8 and 9, and herein set forth and described.

Lastly, under the head of the fifth part of my Invention I claim, the application and adaptation of certain ores or oxides of iron to the purpose of producing the metallic iron powder, or the mode or process of effecting the same, so as to make the iron powder so produced, applicable and effective to the purpose of producing the artificial stone or rock as herein set forth and described.

In witness whereof, I, the said John Potter, have hereunto set my hand and seal, this Second day of November, in the year of our Lord One thousand eight hundred and sixty-four.

JOHN POTTER. (L.S.)

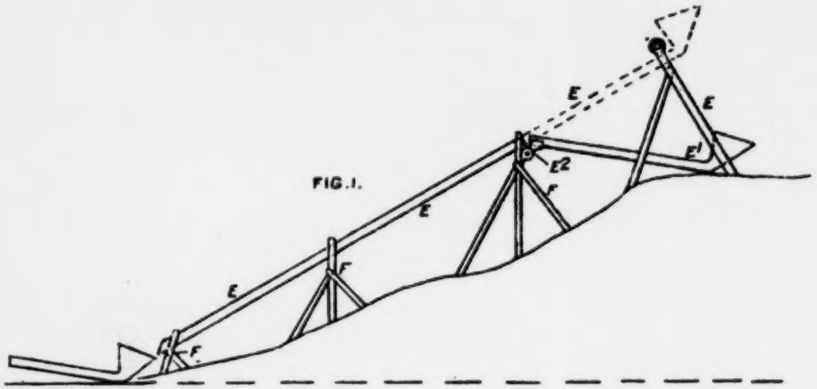
Signed by the within named John Potter, in the presence of,

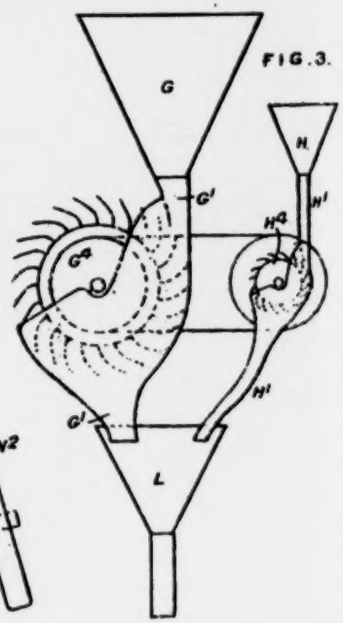
ROBERT LANGTON,
Engraver on Wood,
17, Cross Street,
Manchester.

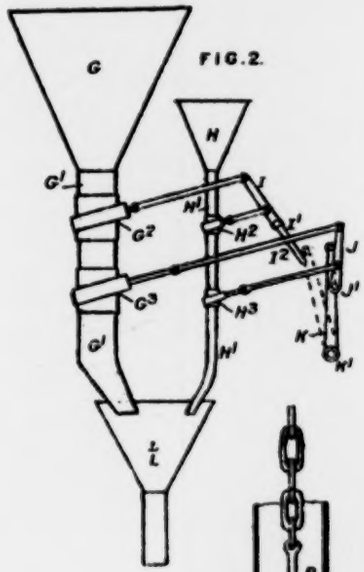
Redhill: Printed for His Majesty's Stationery Office, by Love & Malcomson, Ltd.
[Wt. 49—120/3/1912.]

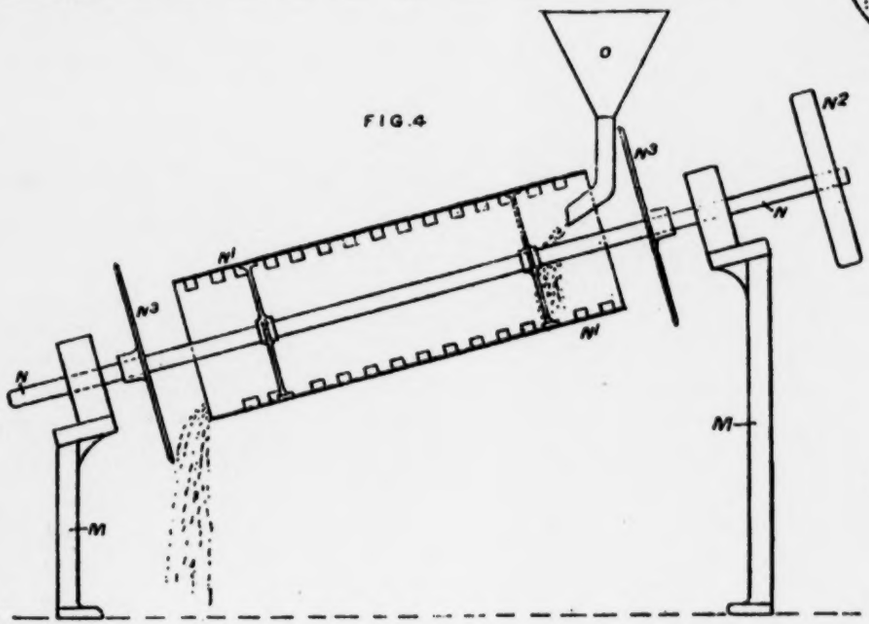
A.D. 1864. May 4. № 1124.
POTTER'S Complete Specification.
(4th Edition)

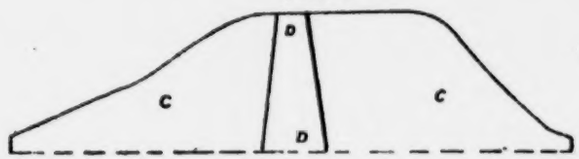
(1 SHEET)





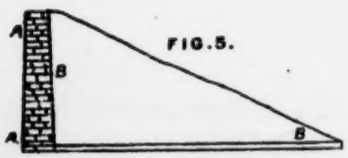


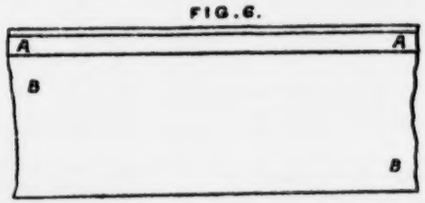


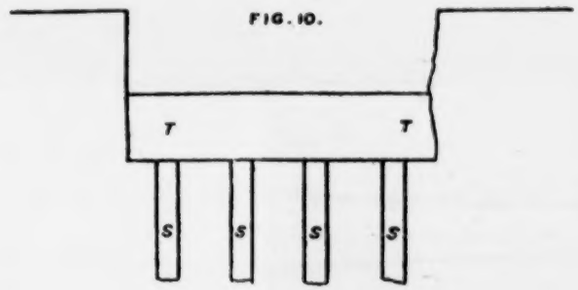












[This Drawing is a reproduction of the Original on a reduced scale]

The filed drawing is partly colored.

[Second Edition.]

885

555

A.D. 1872, 22nd OCTOBER. Nº 3107.

Machinery for Storing Grain and Seed.

LETTERS PATENT to Edward Bayzand Ellington and Joseph Liddell Anderson, both of the City of Chester, Engineers, for the Invention of "IMPROVEMENTS IN MACHINERY FOR THE STORING OF GRAIN AND SEED.

Sealed the 20th December 1872, and dated the 22nd October 1872.

PROVISIONAL SPECIFICATION left by the said Edward Bayzand Ellington and Joseph Liddell Anderson at the Office of the Commissioners of Patents, with their Petition, on the 22nd October 1872.

We, EDWARD BAYZAND ELLINGTON and JOSEPH LIDDELL ANDERSON, both of the City of Chester, Engineers, do hereby declare the nature of the said Invention for "IMPROVEMENTS IN MACHINERY FOR THE STORING OF GRAIN AND SEED," to be as follows :—

This Invention has for its object improvements in the machinery employed in warehousing grain and seed in bulk, the grain being elevated by means of cranes, hoists, or other known appliances, and distributed over the warehouse by creepers or travelling carrying bands. At the point or points where the grain leaves the creepers or bands we

place spouts mounted so that they can be made to revolve, into which the grain passes, and by swinging these spouts the grain is directed to any desired point.

We also employ similar spouts to distribute grain from the elevator on to any one of a number of creepers or bands radiating from the elevator. By combining two or more of such spouts so that each will command all the creepers or bands the grain can be taken from two or more points, generally elevators, and sent from either or all down to any one, two, or more of the creepers or bands.

The revolving spouts may also be so arranged as to receive the grain from one travelling band, and either to deliver it on to other travelling bands at a lower level, which convey the grain to different parts of the warehouse, or by turning the spout it may be made to deliver the grain directly on to the floor or into shoots.

In cases where a travelling band is passed at one or more points over and under two guide rollers, situated the one below the other, so that different portions of the band are thereby at different levels, the said spouts may be placed so as to receive the grain from the part of the band at the higher level, and either to deliver it on to the part of the band at the lower level, or by turning the spout it may be made to deliver the grain on to other bands or creepers, or directly on to the floor or into shoots.

These revolving spouts may either be moved and set directly by hand or they may be shifted by wire ropes, bands, or rods connected from them to levers mounted at a central point of the warehouse, so that an attendant at that point can by moving the levers alter the directions of the several spouts.

SPECIFICATION in pursuance of the conditions of the Letters Patent, filed by the said Edward Bayzand Ellington and Joseph Liddell Anderson in the Great Seal Patent Office on the 18th April 1873.

TO ALL TO WHOM THESE PRESENTS SHALL COME, we, EDWARD BAYZAND ELLINGTON and JOSEPH LIDDELL ANDERSON, both of the City of Chester, Engineers, send greeting.

WHEREAS Her most Excellent Majesty Queen Victoria, by Her Letters Patent, bearing date the Twenty-second day of October, in the year of our Lord One thousand eight hundred and seventy-two, in the thirty-sixth year of Her reign, did, for Herself, Her heirs and successors, give and grant unto us, the said Edward Bayzand Ellington and Joseph Liddell Anderson, Her special license that we, the said Edward Bayzand Ellington and Joseph Liddell Anderson, our executors, administrators, and assigns, or such others as we, the said Edward Bayzand Ellington and Joseph Liddell Anderson, our executors, administrators, and assigns, should at any time agree with, and no others, from time to time and at all times thereafter during the term therein expressed, should and lawfully might make, use, exercise, and vend, within the United Kingdom of Great Britain and Ireland, the Channel Islands, and Isle of Man, an Invention for "**Improvements in Machinery for the Storing of Grain and Seed**," upon the condition (amongst others) that we, the said Edward Bayzand Ellington and Joseph Liddell Anderson, our executors or administrators, by an instrument in writing under our or their hands and seals, or under the hand and seal of one of us or them, should particularly describe and ascertain the nature of the said Invention, and in what manner the same was to be performed, and cause the same to be filed in the Great Seal Patent Office within six calendar months next and immediately after the date of the said Letters Patent.

NOW KNOW YE, that I, the said Edward Bayzand Ellington, on behalf of myself and the said Joseph Liddell Anderson, do hereby declare the nature of the said Invention, and in what manner the same is to be performed, to be particularly described and ascertained in and by the following statement thereof, reference being had to the accompanying Sheet of Drawings, and to the figures and letters marked thereon, that is to say :—

This Invention has for its object improvements in the machinery employed in warehousing grain and seed in bulk, the grain being elevated by means of cranes, hoists, or other known appliances, and distributed over the warehouse by creepers or travelling carrying bands. At the point or points where the grain leaves the creepers or bands we place spouts mounted so that they can be made to revolve, into which the grain passes, and by swinging these spouts the grain is directed to any desired point.

We also employ similar spouts to distribute grain from the elevator on to any one of a number of creepers or bands radiating from the elevator. By combining two or more of such spouts, so that each will command all the creepers or bands, the grain can be taken from two or more points, generally elevators, and sent from either or all down to any one, two, or more of the creepers or bands.

The revolving spouts may also be so arranged as to receive the grain from one travelling band, and either to deliver it on to other travelling bands at a lower level which convey the grain to different parts of the warehouse, or by turning the spout it may be made to deliver the grain directly on to the floor or into shoots.

In cases where a travelling band is passed at one or more points over and under two guide rollers, situated the one below the other, so that different portions of the band are thereby at different levels, the said spouts may be placed so as to receive the grain from the part of the band at the higher level, and either to deliver it on to the part of the band at the lower level, or by turning the spout it may be made to deliver the grain on to other bands or creepers, or directly on to the floor or into shoots.

These revolving spouts may either be moved and set directly by hand, or they may be shifted by wire ropes, bands, or rods connected from them to levers mounted at a central point of the warehouse, so that an attendant at that point can by moving the levers alter the directions of the several spouts.

Description of the Drawings.

Fig. 1 represents a side view; and Fig. 2, a plan of a revolving spout constructed and applied according to this Invention for the purpose of transferring grain, seeds, or such like substances from one travelling band A to another travelling band B at a lower level.

The spout consists of an upper part C and a lower part D, both of which are brought to a cylindrical form at the neck where they meet, and mounted in a framing E, so that they can be turned therein on a vertical axis, either separately or together. It will be seen that when it is desired either to receive or to deliver the grain in a different direction either or both parts of the spout can be turned round to the desired attitude. The dotted lines D^1, in Figs. 1 and 2, show the lower part

turned so as to deliver into a spout or creeper F. Fig. 3 represents a side view of a spout similarly constructed, and applied for transferring the grain from one portion of a travelling band G to another portion of the same band conducted to a lower level by guide rollers *g*, *g*.

The spouts, as above described, may be turned to the desired direction either by hand or in the following manner:—Round the cylindrical neck of either or both of the parts of the spout is formed a groove for a band or cord H, which is passed round suitable guide pullies *h*, *h*, and conveyed to any convenient position. By pulling such bands or cords in the one direction or the other either part or both parts of the spout can be turned as required; and thus from one central point in a granary or warehouse the direction in which the grain is to be received or delivered at various distant points can be commanded.

Fig. 4 represents diagrammatically a plan of an arrangement of such spouts as have been above described in connection with several elevators, travelling bands, creepers, or fixed spouts. e^1, e^2, are elevators by which the grain is raised to the upper floor; and *c*, *c*, are a number of creepers, travelling bands, or delivery spouts for conveying the grain in different directions, as, for example, to millstones or store bins. By arranging these points of delivery circularly round revolving spouts s^1, s^2, such as have been described above, grain can be conveyed from either elevator to any of the points of delivery. For example the spout s^1 can be set so as to convey from the elevator e^1 to the point *d*, as shown in the Figure, or the lower part can be turned to such an attitude as is indicated by the dotted lines s^3, so as to deliver at d^1; and in like manner the spout s^2 can be made to convey grain from the elevator e^2 to d^2, d^3, or other points in the same circle. Again the upper part of the spout s^1 may be turned to e^3, as indicated by the dotted lines s^4, and the upper part of s^2 may be turned as s^5 to e^1, and thus either elevator can be placed in connection with any of the points of delivery.

Having thus described the nature of the said Invention, and in what manner the same is to be performed, we claim,—

First. The use of revolving spouts constructed and operating substantially in the manner and for the purposes herein described.

Second. The mode of turning revolving spouts, such as have been above referred to, by means of cords or bands, so that from one point in a

granary or warehouse the reception and delivery of grain, seeds, and the like at various distant points can be commanded, substantially as herein described.

Third. The arrangement of revolving spouts, such as have been above referred to, so as to bring into connection with one another the elevators, travelling bands, or other apparatus for conveying grain, seeds, and the like throughout a granary or warehouse, substantially as herein described in reference to Fig. 4.

In witness whereof, I, the said Edward Bayzand Ellington, have hereunto set my hand and seal, this Seventeenth day of April, in the year of our Lord One thousand eight hundred and seventy-three.

EDWARD BAYZAND ELLINGTON. (L.S.)

Hereford: Printed for His Majesty's Stationery Office, by The Hereford Times Ltd.
[Wt. 55—25/11/1920.]

(1 SHEET)

A.D. 1872. Oct. 22, No. 3107.

ELLINGTON & ANDERSON'S Specification.

(2nd Edition)

FIG. 1.

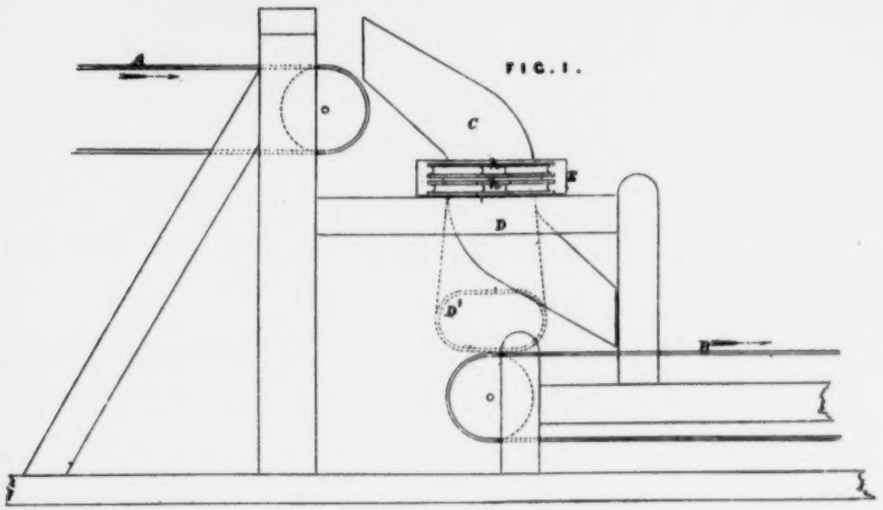


FIG. 3.

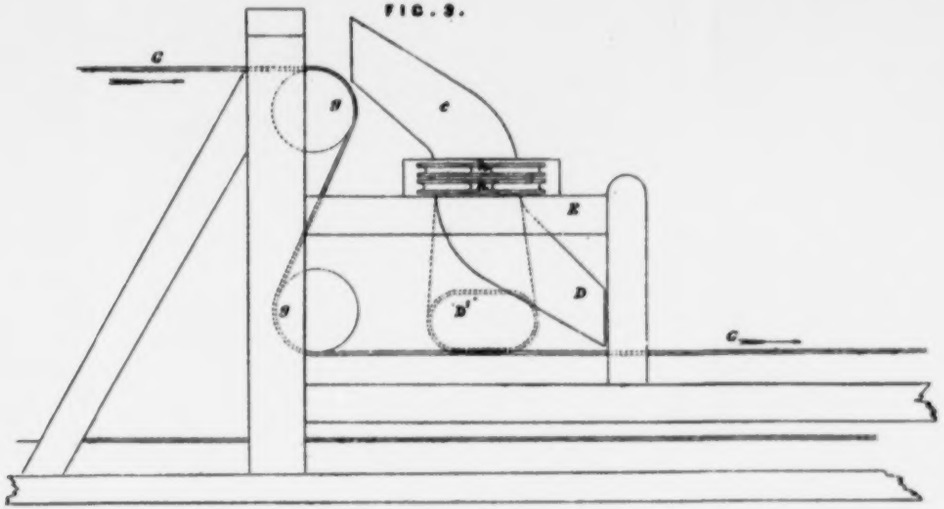


FIG. 2.

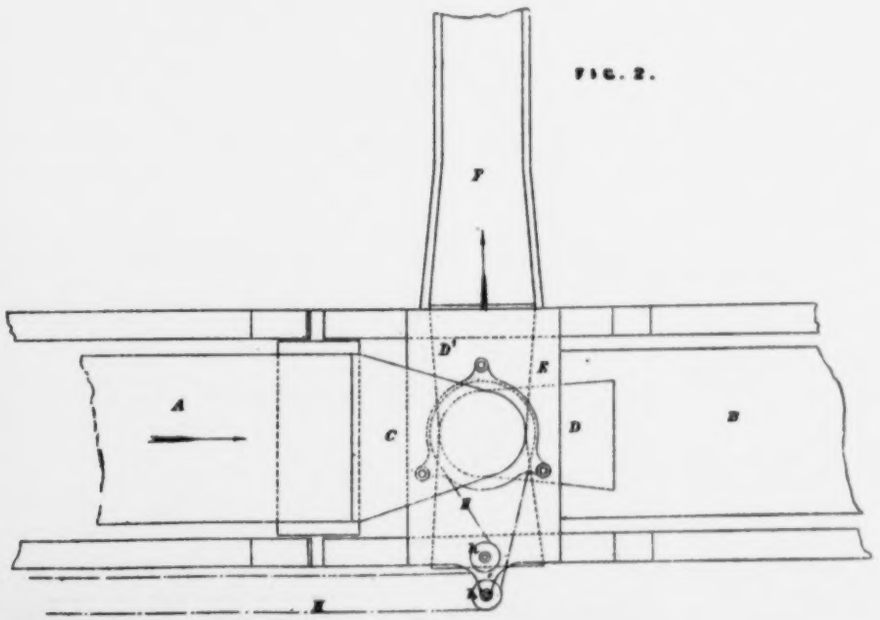
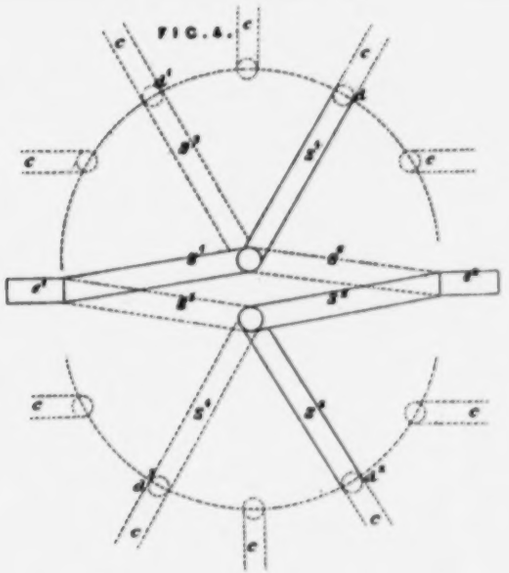


FIG. 4.



(Second Edition.)

A.D. 1880, 18th MAY. No 2017.

Apparatus for Elevating, Transferring, and Cleaning Grain.

LETTERS PATENT to John Henry Johnson, of 47, Lincoln's Inn Fields, in the County of Middlesex, Gentleman, for an Invention of "IMPROVEMENTS IN APPARATUS FOR ELEVATING, TRANSFERRING, AND CLEANING GRAIN." A communication from abroad by William Brown Reaney, of Baltimore, Maryland, and Clement Acton Griscom, of Philadelphia, Pennsylvania, both in the United States of America.

PROVISIONAL SPECIFICATION left by the said John Henry Johnson at the Office of the Commissioners of Patents on the 18th May 1880.

JOHN HENRY JOHNSON, of 47, Lincoln's Inn Fields, in the County of Middlesex, Gentleman. "IMPROVEMENTS IN APPARATUS FOR ELEVATING, TRANSFERRING, AND CLEANING GRAIN." A communication from abroad by William Brown Reaney, of Baltimore, Maryland, and Clement Acton Griscom, of Philadelphia, Pennsylvania, both in the United States of America.

This Invention, which relates to apparatus for elevating, transferring, and cleaning grain, is more especially applicable to the unloading of grain from large or small vessels, and transferring it to suitable houses, freight wagons, boats, or other receptacles, and cleaning the grain on its passage from the vessel to the receptacle.

In the following description the improvements are described as applied to a floating grain-elevating apparatus, but the apparatus may be erected on land or on wharves.

In carrying out this Invention the receiving elevator which is to raise the grain from the hold of the vessel to be unloaded is hinged at the outer end of a swinging arm pivoted to a frame which can be moved up or down on vertical guides on the framework of the apparatus.

When the apparatus is not in use this frame is lowered on its guides to the lower end of the framework, the opposite end of the arm being turned upwards, and the receiving elevator by the same movement is drawn within the framework of the apparatus.

When the apparatus is to be put in use the sliding frame to which the arm carrying the receiving elevator is pivoted is raised on the guides until the lower end of the receiving elevator can be swung over the rail of the vessel to be unloaded,

[Price 8d.]
PRICE 1/-

suitable hoisting ropes being provided. The receiving elevator, by the lowering of the rope and the swinging of the arm, is then lowered down the hatchway into the hold of the vessel to the depth necessary to permit the grain to flow steadily into the elevator case to be elevated by the travelling buckets to the top of the case. The raising and lowering of the slide, the swinging arm, and receiving elevator is accomplished by means of suitable hoisting ropes of wire or other material passing over pulleys at the upper end of the framework down to a drum or drums at the lower end, connected by clutch devices to the main driving shaft.

From the top of the receiving elevator the grain flows through pipes to a shifting spout. One of these pipes is hinged to the receiving elevator so as to accommodate itself to the position of the latter. This pipe has a sleeve on the outside which is hinged to slide blocks at the upper end of the spout, so that when the swinging arm and receiving elevator are raised, and the pipe has been thereby withdrawn from the other pipe, the slide blocks will move in vertical guides in the framework immediately over the spout, and consequently when the elevator case and swinging arm are lowered again into position the one pipe will slide back into proper position with the other pipe.

Immediately below the shifting spout are two weighing hoppers, so that when one hopper is filled with grain the spout is turned to fill the other. The full weighing-hopper is then emptied by allowing the grain to flow into the hopper, from which it is elevated by a second elevator, and delivered from the upper end of the latter through a suitable spout and spreader into the cleaning apparatus, which will be hereinafter described. From the cleaning apparatus the grain passes through a spout to a hopper, from which it is elevated by a third elevator, and delivered from the top of the latter through a spout to the necessary receptacle for transportation or storage.

Each of the three elevators is constructed in the usual manner of a closed case containing an endless belt carrying the usual elevating buckets, and passing over pulleys at the top and bottom of the case. The spindle of the pulley at the upper end of each case passes to the outside, and is provided with a pulley for the driving belt. The upper pulleys of the two elevators secondly mentioned may be mounted on the same shaft, in which case only one driving pulley will be necessary for both elevators, this pulley being driven by a suitable belt from a pulley on the driving shaft. The shaft at the upper end of the receiving elevator is provided with two driving pulleys, over which pass driving belts passing round a pulley at the point where the swinging arm is pivoted to the sliding frame. This latter pulley driven by a belt passes over an idler pulley at the top, and over a driving pulley near the bottom of the apparatus, and round a combination of pulleys at the point where the swinging arm is pivoted to the sliding frame.

The cleaner above referred to is provided at the top with the spreader, as has been described, and below the latter is a shaking screen through which the grain passes, while the cobs and the like pass into a box at the end. The grain from the screen falls into an inclined tray, which directs it to a passage and hopper leading to the delivery pipe or spout above described. A fan communicating with the cleaning chamber draws air through the grain as it descends through the passage. The heavy dust exhausted from the grain falls into a chamber, while the lighter particles are carried with the air current through the fan and discharged outside the apparatus. The current of air is regulated by a valve arranged at any suitable point.

The cleaning apparatus above described may however be dispensed with, in which case the second hopper and the third elevator will no longer be required, and the grain can be discharged into the necessary receptacle for storage or transportation by the second elevator, or even in some cases the grain may be directly discharged from the receiving elevator through its delivery spout to the desired receptacle.

SPECIFICATION in pursuance of the conditions of the Letters Patent filed by by the said John Henry Johnson in the Great Seal Patent Office on the 18th November 1880.

JOHN HENRY JOHNSON, of 47, Lincoln's Inn Fields, in the County of Middlesex, Gentleman. "IMPROVEMENTS IN APPARATUS FOR ELEVATING, TRANSFERRING, AND CLEANING GRAIN." A communication from abroad by William Brown Reaney, of Baltimore, Maryland, and Clement Acton Griscom, of Philadelphia, Pennsylvania, both in the United States America.

The said Invention, which relates to apparatus for elevating, transferring, and cleaning grain, is more especially applicable to the unloading of grain from large or small vessels, and transferring it to suitable houses, freight wagons, boats, or other receptacles, and cleaning the grain on its passage from the vessel to the receptacle.

In the following description the Invention is described as applied to a floating grain elevating apparatus, but the apparatus may be erected on land or on wharves.

In the accompanying Drawings,—

Figure 1 (Sheet 1) is a view shewing a transverse section of the vessel to be unloaded and of the floating grain elevator alongside.

Figure 2 (Sheet 2) is a side or face view of the floating grain elevator, shewing the interior parts in dotted lines.

Figures 3, 4, and 5 are detached sectional views of the cleaning apparatus.

The receiving elevator A, which is to raise the grain from the hold of the vessel H¹ to be unloaded, is hinged at the outer end of a swinging arm G pivoted to a frame N², which can be moved up or down on vertical guides on the framework of the apparatus.

When the apparatus is not in use this frame is lowered on its guides to the lower end of the frame work to the position N¹ (Figure 1), the arm G being swung up to the position shewn by dotted lines at G¹, and the receiving elevator A by the same movement drawn within the framework of the grain boat or house to the position shewn by dotted lines at A¹.

When the apparatus is to be put in use the sliding frame, to which the arm G carrying the receiving elevator A is pivoted, is raised on the guides by hoisting ropes, as hereinafter described, until the lower end of the receiving elevator can be swung over the rail of the vessel to be unloaded, as shewn by the dotted lines A², G², the position of the hoisting rope or ropes for raising the outer end of the arm being indicated at E². The receiving elevator, by the lowering of the rope E² (E¹), and the consequent swinging of the arm G, is then lowered down the hatchway K¹ into the hold of the vessel to the depth necessary to permit the grain to flow steadily into the elevator case to be elevated by the travelling buckets to the top of the case. The raising and lowering of the sliding frame N², the swinging arm, and receiving elevator is accomplished by means of suitable hoisting ropes E¹, (E²), and F², F², of wire or other material, passing over pulleys at the upper end of the framework down to a drum or drums at the lower end, connected by clutch devices to the main driving shaft L¹ (Figure 2).

From the top of the receiving elevator A the grain flows through the pipes B and C to the shifting spout D (Figure 1). The pipe B is hinged at U¹ to the receiving elevator A, so as to accommodate itself to the position of the latter. The pipe B has a sleeve on the outside, which is hinged to slide blocks at the upper

end of the spout D, so that when the swinging arm and receiving elevator A are raised, and the pipe B has been thereby withdrawn from the pipes C, the slide-blocks will move in vertical guides V^1 (Figure 1) in the framework, immediately over the spout D, and consequently when the elevator case and swinging arm are lowered again into position the pipe B will slide back into proper position with respect to the pipe C.

Immediately below the shifting spout D are two weighing hoppers E, E, so that when one hopper is filled with grain the spout D is turned to fill the other. The full weighing hopper is then emptied by allowing the grain to flow into the hopper F, from which it is elevated by a second elevator F^1, and delivered from the upper end of the latter through a suitable spout H and spreader K into the cleaning apparatus L (Figures 2 and 3), which will be hereinafter described. From the cleaning apparatus the grain passes through a spout M (Figure 2) to a hopper N, from which it is elevated by a third elevator P, and delivered from the top of the latter through a spout Q (Figure 1) to the necessary receptacle for transportation or storage.

Each of the three elevators A, F^1, and P is constructed in the usual manner of a closed case containing an endless belt carrying the usual elevating buckets, and passing over pulleys at the top and bottom of the case. The spindle of the pulley at the upper end of each case passes to the outside, and is provided with a pulley for the driving belt. The upper pulleys of the elevator F^1 and P may be mounted on the same shaft T^1, in which case only one driving pulley S^1 (Figure 2) will be necessary for both elevators, this pulley S^1 being driven by a suitable belt from a pulley R^1 on the driving shaft L^1. The shaft at the upper end of the receiving elevator is provided with two driving pulleys Q^1, over which pass driving belts passing round a pulley at the point where the swinging arm G is pivoted to the sliding frame N^2. This latter pulley is driven by a belt passing over it and under guide pulleys *n*, above and below it (Figure 1), and round an idler pulley P^1 at the top, and over a driving pulley M^1 near the bottom of the apparatus.

The cleaner L above referred to is provided at the top with the spreader K, as has been described and as shown in Figures 3 and 4.

This spreader is provided with a regulating valve B^2 hinged at B^1, and below the spreader is a shaking screen R, through which the grain passes, while the cobs and the like pass into a box S (Figure 3) at the end. The grain from the screen falls into an inclined tray T, which directs it to a passage U and hopper V leading to the delivery pipe or spout M above described. A fan W communicating with the cleaning chamber draws air through the grain as it descends through the passage U, as indicated by the arrows *x*. The heavy dust exhausted from the grain falls into a chamber C^1, while the lighter particles are carried with the air current through the fan and discharged outside the apparatus, as indicated by the arrows *y*. The current of air is regulated by a valve D^1 arranged at any suitable point.

The cleaning apparatus above described may however be dispensed with, in which case the second hopper N and the third elevator P will no longer be required, and the grain can be discharged into the necessary receptacle for storage or transportation by the second elevator, or even in some cases the grain may be directly discharged from the receiving elevator through its delivery spout to the desired receptacle.

Having now described and particularly ascertained the nature of the said Invention, and the manner in which the same is or may be used or carried into effect, I would observe in conclusion that what I consider to be novel and original, and therefore claim as the as the Invention secured to me by the hereinbefore in part recited Letters Patent is,—

First. The combination of the receiving elevator with the swinging arm and vertically sliding frame and hoisting ropes, by which the receiving elevator may be

readily introduced into and withdrawn from the holds of vessels of any size, substantially as hereinbefore described.

Second. The general construction, arrangement, and combination of parts constituting an apparatus for elevating, transferring, and cleaning grain, substantially as hereinbefore described and illustrated in the accompanying Drawings.

In witness whereof, I, the said John Henry Johnson, have to this my Specification set my hand and seal, this Eighteenth day of November, One thousand eight hundred and eighty.

J. HENRY JOHNSON. (L.S.)

Redhill: Printed for His Majesty's Stationery Office, by Love & Malcomson, Ltd.

[C. 9695—25—11·1906.]

BLUEPRINT
TOO
LARGE
FOR
FILMING

COMPLETE SPECIFICATION

[fol. 573] A. D. 1888.—No. 10,380

Improved Method and Apparatus for Coaling Ships from Floats or Barges

I, Robert Baillie, of London Yard, Isle of Dogs, in the County of Middlesex, Civil Engineer, do hereby declare the nature of this Invention and in what manner the same is to be performed to be particularly described and ascertained in and by the following statement:—

My invention relates to an improved method and apparatus for coaling ships from floats, or barges, wherein the coals are conveyed from the float or barge to the ship by means of an arrangement of chain buckets and shoots, constructed and operating as follows.

Upon the coaling float is arranged a staging upright, or mast of suitable height carrying at its upper end a crosshead capable of controlled vertical travel, which crosshead carries a shaft, or shafts on which is or are hinged a boom or booms having pullies or sprocket wheels at each end over which run endless chains or wire ropes carrying buckets.

These booms rest with bearing rollers or wheels on their lower ends either upon the surface of the coals in the float, or upon the weather deck therof or over the ceiling in the bottom of the hold, or on any other convenient surface, so that the coals are either gripped by the travelling chain buckets or are fed into them.

The crosshead carrying the upper ends of the booms as also the upper framework on which it is mounted is adapted to be raised and lowered by screws or other mechanical appliances which are worked by small steam engines placed conveniently either above or below the weatherdeck, which may also serve to drive the shafts on the crosshead by which the travelling motion is imparted to the chain buckets. Thus according to the height to which the crosshead is adjusted, the lower ends of the boom may either be situated at a point close alongside of the staging, upright or mast, or they may be made to extend any desired distance therefrom, according to the point of the float from which it is desired to take the coals, and by gradually raising or lowering the crosshead either while the chain buckets are at work or while they are not in operation the lower ends of the booms may be made to travel gradually along the surface on which they rest. The upper part of the staging, uprights or masts may conveniently be made to slide telescopically in the lower part, and be provided with suitable locking gear for holding the staging &c. in whatever position it is raised or lowered to, such locking gear being controlled from the weather deck, and the raising and lowering of the crosshead &c. may be effected by means of the gear thereon that drives the chain buckets or by independent gear.

The coal raised by the chain buckets to the crosshead is there delivered into a hopper also carried by the crosshead, to which are

jointed shoots through which the coal is conveyed to the coal bunkers of the ship to be coaled. These shoots may either be fixed or, by preference, they are made with hinge joints so as to be capable of both horizontal and vertical motion, and they may have hinged [fol. 574] spouts or funnels at their outer ends for the convenient delivery of the coal into any bunker or other place intended for its reception.

The before mentioned engines for working the coaling apparatus may either be supplied with steam from special donkey boilers or steam from the main boilers of the float or barge (when this is propelled by steam power) may be supplied to these engines through pipes, and the exhaust steam may also be conveyed by pipes to the condenser of the ship's engines, the condenser being kept in active condition by the ordinary engine-room donkey pump.

In order that my above described invention may be readily understood I will proceed to describe by way of example the arrangement for carrying the same into effect shewn on the accompanying drawings, in which Fig. 1 shows a side view of part of a coaling float, with the coaling apparatus in the elevated position, ready to discharge coal; Fig. 2 is a transverse section showing the same position of the apparatus, Fig. 3 is a side elevation showing the coaling apparatus lowered in sea going trim, Fig. 4 is an end elevation of the coaling float, also with the apparatus in the lowered position, Fig. 5 is a plan shewing the space occupied by the coaling apparatus on the weather deck when in sea going trim.

The same letters of reference indicate the same parts in each of the figures.

The staging for the coaling apparatus consists firstly of the lower standards or masts A, which are fixed on deck and braced diagonally so as to form a rigid structure and secondly the upper part consisting of standards or masts B B framed together at top, that slide telescopically in the lower ones A and which carry at top the crosshead C, such upper part and crosshead being raised or lowered by elevating screws attached to the crosshead C and driven from below deck by engines in the engine room D.

The standards B are locked in the position to which they are adjusted, by locking bolts E E which are shot in position by small levers from the deck and attached to the lower part A. When the standards are locked in position the wire rope guys F are tightened up and belayed, thus rendering the structure sufficiently rigid.

The crosshead C carries the hopper G forming part thereof and which receives the coal from the chain buckets and conveys the same to the coaling shoots being provided internally with a hinged flap adjustable to an angle to either side, so as to guide the descending coals either to the port or the starboard shoot as required.

To the shoot G are attached the telescopic coal shoots H H which are arranged to swivel in a horizontal direction on pivots at I I Fig. 2 attached to the crosshead C and they have also a hinge joint at K whereby they are enabled to swivel also in a vertical direction; the shoots have also pivoted spouts or funnels L L at their outer

ends and they are guyed into any desired position for dropping these spouts into the bunker holes or hatches of the vessel to be coaled, as indicated by the full and dotted lines at Fig. 2, the latter shewing the extreme extended position of the shoots and spouts M M are the booms, which are hinged on the shafts N carried in bearings on the crosshead C and having fixed thereon sprocket wheels over which pass the endless chains or wire ropes carrying the steel plate buckets P, P, and passing over other sprocket wheels on shafts at the lower ends of the booms, which also carry bearing wheels O O by means of which the booms rest upon the surface, thus allowing these ends to travel easily along, as the crosshead C is raised or lowered, to the most convenient position for the buckets to pick up the coal. The dotted positions shewn in Fig. 1 shew the extreme positions of the booms when discharging the coal, these positions being given by the same screw or other gear that raises or lowers the upper standards B B.

When these standards are locked in position and guyed the crosshead is free and can be lowered or elevated to any position on the standards that is most convenient for working the cargo.

The chain buckets are worked by means of suitable toothed gearing driving spur or bevil wheels on the ends of the shafts N, and receiving motion from the engines at D through a vertical shaft attached at the upper end of the crosshead C or in any other convenient manner.

[fols. 575 & 576] It will be seen from the foregoing description that the mechanism for raising and lowering the crosshead with coal shoots booms and chain buckets is quite independent of the gear actuating the sprocket wheels and buckets, so that the one motion may be effected independently of the other, or they may both be effected simultaneously at the will of the person in charge of the work.

The small engines for working the above described apparatus are as before stated placed below deck and may be supplied with steam from the main boilers S of the float and the exhaust steam is led to the condenser of the float's engines: this arrangement has the advantage of dispensing with donkey boilers and of keeping the main boilers in their normal working condition with regard to water. If desired however or where the float or barge is not propelled by steam special donkey boilers may be provided for working the coaling engines.

Having now particularly described and ascertained the nature of this said invention and in what manner the same is to be performed, I declare that what I claim is:—

1. The herein described method of coaling ships from floats or barges whereby the coal is raised from the float to an elevated discharge by means of endless chain buckets carried by supports or booms whose upper ends are arranged to move vertically up or down so as to bring the lower ends to any point of the coaling float from which it is desired to take the coal.

2. Apparatus for coaling ships from floats or barges wherein booms carrying endless chain buckets are hinged at their upper ends to an

elevated crosshead on a staging, unright or mast which crosshead can be raised or lowered so as to bring the lower ends of the booms to any point from which it is desired to take the coal a hopper being provided on the crosshead for receiving the coal from the chain buckets and for delivering the same to pivotted shoots for conveying the coal to the ship, substantially as herein described.

3. Apparatus for coaling ships from floats or barges combined and operating substantially as herein described with reference to the drawings.

Dated this 16th day of April, 1889.

Abel & Imray, Agents for the Applicant.

London: Printed for Her Majesty's Stationery Office by Darling and Son, Ltd. 1889.

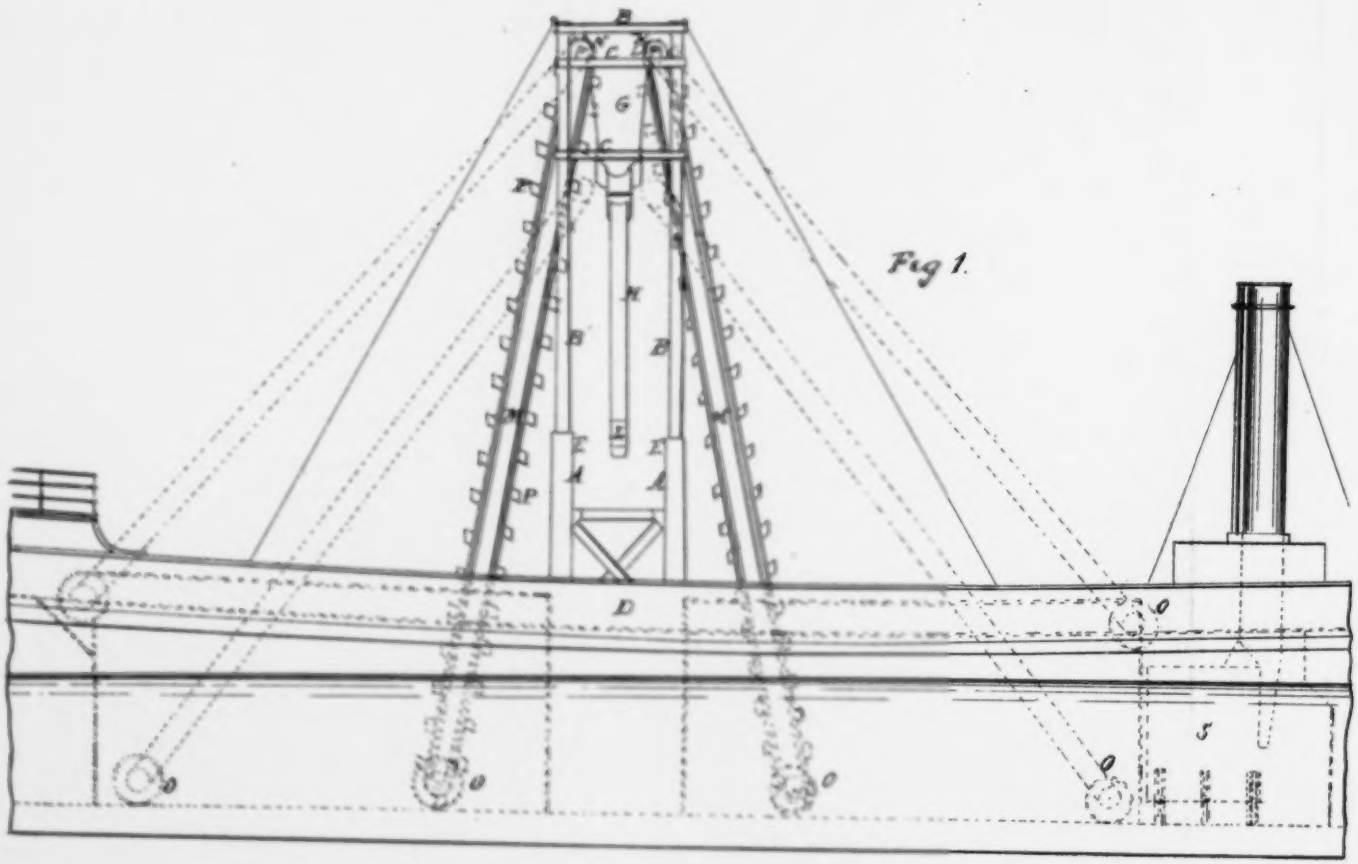


Fig 1.

[This Drawing is a reproduction of the Original on a reduced scale.]

London: Printed for Eyre and Spottiswoode, Her Majesty's Printers. [illegible]

Malby & Sons, Photo-Litho.

905
581-582
(3 SHEETS)
(SHEET 2)

Fig 2

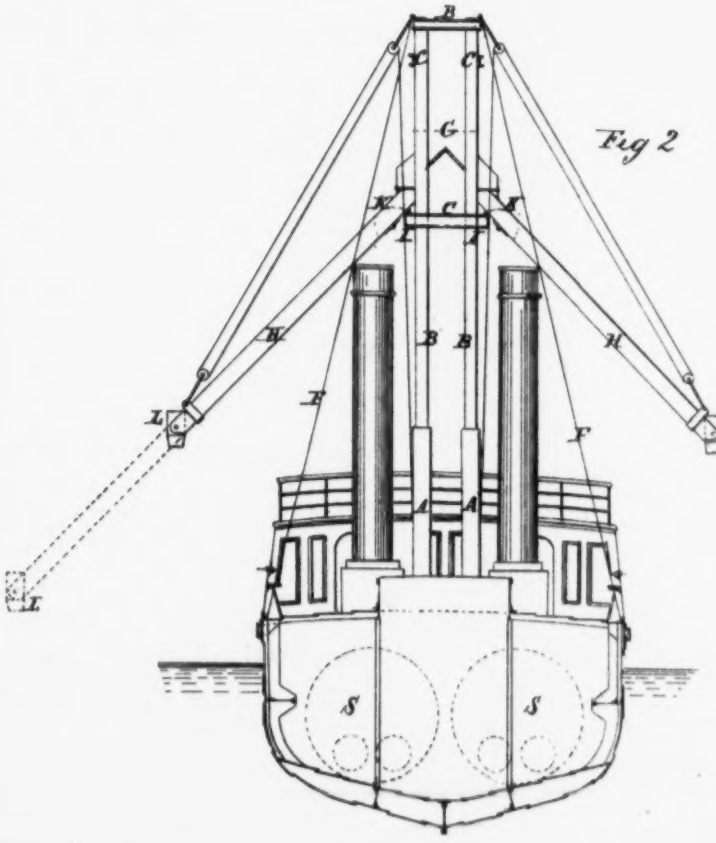
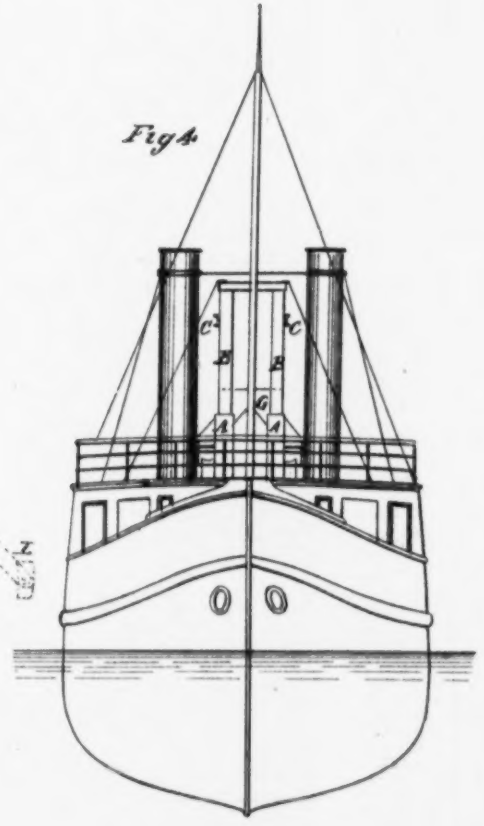


Fig 4



(This Drawing is a reproduction of the Original on a reduced scale.)

London: Printed by Darling and Son Ltd.
for the Queen's Stationery Office. 1889.



[Second Edition.]

N° 16,525 A.D. 1895

Date of Application, 3rd Sept., 1895
Complete Specification Left, 3rd July, 1896—Accepted, 3rd Dec., 1896

PROVISIONAL SPECIFICATION.

Improvements in Apparatus for Shipping or Transferring Coal and other Materials

I, JOHN PEARCE ROE, of 150 Leadenhall Street, in the City of London, Engineer, do hereby declare the nature of this invention to be as follows :—

This invention has for object to enable coal and other material to be shipped or transferred from one place to another in a rapid and continuous manner with the minimum of labour, and breakage of material.

For this purpose the coal or other material (hereinafter referred to as material) is discharged from waggons or other suitable receptacles into a hopper or receiver from the bottom of which it is discharged onto an endless travelling band, hereinafter called the delivery band, by which the material is carried to a point whence it can be discharged into the hold of a ship or other place. The capacity of the hopper may advantageously be such that the variation in the level of the material, due to its withdrawal from below during the short intervals between the discharge of successive waggons, will be small, so as to thereby reduce the breakage of the material to a minimum.

The rate of discharge from the bottom of the hopper is regulated by suitable means which also serve to convey the material from the bottom of the hopper to the delivery band. For this purpose an inclined shoot in one or more sections may be used, arranged at the hopper nose and having a jig motion that may be adjustable so as to regulate discharge according to requirements. Or in lieu of a shoot, an endless travelling band (hereinafter called for distinction the feeding band) may be used, arranged at the bottom of the hopper in such a manner as to practically form an extension of the hopper bottom.

When a band is used, it may be arranged to work beneath extensions of the hopper sides, and is preferably provided with sides embracing the lower edges of the said hopper extensions so as to prevent escape of small material between such extensions and the band. Or the band may be arranged to pass through an opening in the lower portion of the hopper so as to pass over the hopper bottom and between the extensions of the hopper sides. The feeding band may have a non perforated bottom, or the said band and the hopper bottom may be formed with openings. When a jig shoot is used, the sides thereof form lateral extensions of the hopper. The arrangement in either case may be such that the jig shoot or feeding band when at rest, forms a toe of sufficient length to prevent any flow of material from the hopper, and when it or they is or are set in motion, the withdrawal of material will be proportionate to the speed of the shoot or band and to the cross sectional area of the opening in the hopper the feeding device when in motion withdrawing material of small and large size indiscriminately at a regular given rate that can be varied at will to suit requirement by adjusting the motion of the said feeding device.

In some cases the jig shoot, or the feeding band, may be provided with a pivoted flap or part adapted to form a stop when the motion of the shoot or feeding band ceases.

As the jig shoot or feeding band would have a depth of material upon it corresponding roughly to the height of the opening in the bottom of the hopper,

[Price 8d.]
PRICE 1/-

its speed would be usually comparatively moderate, and to continue the movement of material forward, the jig shoot or shoots, or feeding band, is arranged to deliver onto another band (herein called the delivery band) that may advantageously run at a greater velocity and have therefore a reduced thickness of material upon it. By this means owing to the thickness of material upon the delivery band being moderate, the structural scantlings for carrying this band can be proportionately light, thereby enabling the band to be readily adjusted or moved to adapt it to various applications where this power of adjustment would be advantageous, as for example in shipping coal, where it is of importance to be able to move the outer end of the delivery band to various positions over a vessel's hatchways and to provide for differences in level.

The angular or radial adjustment of the delivery band, can be effected in various ways.

In one arrangement the delivery band is pivoted at its inner end for vertical movement, and to permit of horizontal movement, the hopper may turn bodily, or it may be made in two parts that are circular in plan at the line of junction and the lower of which together with the feeding and delivery bands is made to turn horizontally as upon a centre or roller path, the centre of motion in each case corresponding to the centre of the circular portion of the hopper. This arrangement admits of an increased radius for horizontal swing, and of a simple construction of driving mechanism for the delivery band, besides keeping the feeding and delivery bands always in line.

The inner end of the delivery band may also be mounted on a carriage or slide or be otherwise so supported as to enable the band to be run in and out so as to serve for example a wide hatch and permit of its being housed. In this arrangement the part of the delivery band that would receive the material from the feeding device may be made to move through a straight or curved path beneath the feeding device in which case the girders carrying the outer portion of the band would be pivoted or jointed to those carrying the inner portion so as to allow for vertical radial movement.

The girders supporting the delivery band are or may be partly suspended or supported from a structure by suitable connections operated by hydraulic or other mechanism for effecting and permitting the horizontal and vertical adjustments of the band.

The apparatus hereinbefore described, may be mounted on a frame having radial movement over a quay wall. Or it may also be carried by a frame or structure mounted on ways parallel with a quay wall. An auxiliary frame supported by and having radial movement upon the main frame may in some cases advantageously be employed for carrying the hydraulic or other mechanism used for effecting the vertical and horizontal radial movements of the delivery band girders. The main or auxiliary frame may also carry other appliances for suspending or handling suitable devices such as hereinafter described, for distributing the material supplied by the delivery band.

To admit of a number of waggons being quickly discharged one after another into the main hopper, and thereby to avoid the loss of time involved when each empty waggon has to be moved back to a crossing at the rear of the tip, the entering and leaving tracks may be so arranged in relation to tipping apparatus that each waggon can be quickly moved from the one track to the other along a connecting length of track, or crossing, located in front of the tip, or be conveyed from one track to the other by a suitable traverser similarly located, the arrangement in each case being such as to admit of a waggon after being dumped passing on in the same direction so as to admit of the next waggon to be dumped following immediately in the rear of the first one.

In one arrangement suitable for use where the waggons are to be dumped, there is an oscillating cradle to receive and tip each waggon in succession. The cradle may be operated either by mechanical power, or by gravity. Movable stops or buffers are provided against which each waggon takes when in position

for tipping, the said stops or buffers being so constructed and arranged as to swing or otherwise move clear of the waggon to permit of its being passed forward when emptied. After being tipped each waggon may move onward to reverse points.

For low level tracks an elevator and drop may be provided whereby the waggons can be lifted at one end of the tip and lowered at the other end thereof after being dumped. The tracks may be arranged either parallel with, or at an angle to the quay wall, and the elevator and drop may be arranged to turn through any desired number of degrees during ascent and descent when the lower tracks do not run in line with those at the higher level. When hopper bottom or other type of self dumping waggons are used, the tip cradle is dispensed with.

Where a hopper, and the other devices hereinbefore described are carried by a movable frame or structure, the tipping or dumping apparatus and traverser, or reverse points, or the elevator and drop, as the case may be, can be mounted on the said main frame or structure so that the whole can be moved together.

Various means may be provided for conducting or distributing the stream of material in any desired direction and to any desired place after it leaves the end of the delivery band. For this purpose a curved or other shaped shoot or guide may be used, hinged or pivoted in such a manner as to admit of vertical adjustment, by any suitable means.

The shoot or guide may be of various shapes.

For distributing or trimming coal or other material, as for example in the hold of a ship, I provide in connection with apparatus adapted to supply a continuous stream of material, mechanical trimming devices that may be suspended from points outside the ship's hold, so as to be capable of being readily inserted into manœuvred within and withdrawn from the ship's hold and are so constructed and arranged that the material can be delivered fore and aft and athwart ship in such a manner as to avoid impact and breakage as far as possible. Where the place to which the material is to be delivered is such that the force of gravity will be sufficient to cause the delivery of the material to the required place, the trimming device may be in the form of a curved shoot the entry end of which may be approximately vertical whilst the lower portion is curved in a lateral direction, and may be of such a shape as to considerably reduce the velocity of the material before it finally leaves the shoot. The said shoot may be made in two or more sections capable of moving one over or within the other.

According to another arrangement the trimming device comprises one or more endless conveying devices driven where necessary by a self contained motor, and arranged to pass over drums carried by light girders or other supports which may be telescopically mounted in relation to other girders or supports, the whole being suspended so that it can be conveniently adjusted to suitable heights and positions and the arrangement being such that material delivered upon the receiving end of the conveying device will be carried forward and delivered where required. The conveying device in this arrangement may be in the form of a band adapted to carry the material, or it may consist of ropes or chains connected by transverse parts adapted to cause the material to travel over a relatively fixed surface. Where two or more conveying devices are used they may be driven at different velocities.

In another arrangement the trimming device comprises a shoot and band the one being arranged to deliver by gravity onto the other which carries the material forward and delivers it at the required place, the whole being suitably suspended as before and the band being driven, where necessary, by a self contained motor, and being capable when desirable of movement relatively to the shoot so that the length of the said device can be varied to suit different requirements. The shoot and band may in some cases be so constructed and arranged that the material

its speed would be usually comparatively moderate, and to continue the movement of material forward, the jig shoot or shoots, or feeding band, is arranged to deliver onto another band (herein called the delivery band) that may advantageously run at a greater velocity and have therefore a reduced thickness of material upon it. By this means owing to the thickness of material upon the delivery band being moderate, the structural scantlings for carrying this band can be proportionately light, thereby enabling the band to be readily adjusted or moved to adapt it to various applications where this power of adjustment would be advantageous, as for example in shipping coal, where it is of importance to be able to move the outer end of the delivery band to various positions over a vessel's hatchways and to provide for differences in level.

The angular or radial adjustment of the delivery band, can be effected in various ways.

In one arrangement the delivery band is pivoted at its inner end for vertical movement, and to permit of horizontal movement, the hopper may turn bodily, or it may be made in two parts that are circular in plan at the line of junction and the lower of which together with the feeding and delivery bands is made to turn horizontally as upon a centre or roller path, the centre of motion in each case corresponding to the centre of the circular portion of the hopper. This arrangement admits of an increased radius for horizontal swing, and of a simple construction of driving mechanism for the delivery band, besides keeping the feeding and delivery bands always in line.

The inner end of the delivery band may also be mounted on a carriage or slide or be otherwise so supported as to enable the band to be run in and out so as to serve for example a wide hatch and permit of its being housed. In this arrangement the part of the delivery band that would receive the material from the feeding device may be made to move through a straight or curved path beneath the feeding device in which case the girders carrying the outer portion of the band would be pivoted or jointed to those carrying the inner portion so as to allow for vertical radial movement.

The girders supporting the delivery band are or may be partly suspended or supported from a structure by suitable connections operated by hydraulic or other mechanism for effecting and permitting the horizontal and vertical adjustments of the band.

The apparatus hereinbefore described, may be mounted on a frame having radial movement over a quay wall. Or it may also be carried by a frame or structure mounted on ways parallel with a quay wall. An auxiliary frame supported by and having radial movement upon the main frame may in some cases advantageously be employed for carrying the hydraulic or other mechanism used for effecting the vertical and horizontal radial movements of the delivery band girders. The main or auxiliary frame may also carry other appliances for suspending or handling suitable devices such as hereinafter described, for distributing the material supplied by the delivery band.

To admit of a number of waggons being quickly discharged one after another into the main hopper, and thereby to avoid the loss of time involved when each empty waggon has to be moved back to a crossing at the rear of the tip, the entering and leaving tracks may be so arranged in relation to tipping apparatus that each waggon can be quickly moved from the one track to the other along a connecting length of track, or crossing, located in front of the tip, or be conveyed from one track to the other by a suitable traverser similarly located, the arrangement in each case being such as to admit of a waggon after being dumped passing on in the same direction so as to admit of the next waggon to be dumped following immediately in the rear of the first one.

In one arrangement suitable for use where the waggons are to be dumped, there is an oscillating cradle to receive and tip each waggon in succession. The cradle may be operated either by mechanical power, or by gravity. Movable stops or buffers are provided against which each waggon takes when in position

for tipping, the said stops or buffers being so constructed and arranged as to swing or otherwise move clear of the waggon to permit of its being passed forward when emptied. After being tipped each waggon may move onward to reverse points.

For low level tracks an elevator and drop may be provided whereby the waggons can be lifted at one end of the tip and lowered at the other end thereof after being dumped. The tracks may be arranged either parallel with, or at an angle to the quay wall, and the elevator and drop may be arranged to turn through any desired number of degrees during ascent and descent when the lower tracks do not run in line with those at the higher level. When hopper bottom or other type of self dumping waggons are used, the tip cradle is dispensed with.

Where a hopper, and the other devices hereinbefore described are carried by a movable frame or structure, the tipping or dumping apparatus and traverser, or reverse points, or the elevator and drop, as the case may be, can be mounted on the said main frame or structure so that the whole can be moved together.

Various means may be provided for conducting or distributing the stream of material in any desired direction and to any desired place after it leaves the end of the delivery band. For this purpose a curved or other shaped shoot or guide may be used, hinged or pivoted in such a manner as to admit of vertical adjustment, by any suitable means.

The shoot or guide may be of various shapes.

For distributing or trimming coal or other material, as for example in the hold of a ship, I provide in connection with apparatus adapted to supply a continuous stream of material, mechanical trimming devices that may be suspended from points outside the ship's hold, so as to be capable of being readily inserted into manœuvred within and withdrawn from the ship's hold and are so constructed and arranged that the material can be delivered fore and aft and athwart ship in such a manner as to avoid impact and breakage as far as possible. Where the place to which the material is to be delivered is such that the force of gravity will be sufficient to cause the delivery of the material to the required place, the trimming device may be in the form of a curved shoot the entry end of which may be approximately vertical whilst the lower portion is curved in a lateral direction, and may be of such a shape as to considerably reduce the velocity of the material before it finally leaves the shoot. The said shoot may be made in two or more sections capable of moving one over or within the other.

According to another arrangement the trimming device comprises one or more endless conveying devices driven where necessary by a self contained motor, and arranged to pass over drums carried by light girders or other supports which may be telescopically mounted in relation to other girders or supports, the whole being suspended so that it can be conveniently adjusted to suitable heights and positions and the arrangement being such that material delivered upon the receiving end of the conveying device will be carried forward and delivered where required. The conveying device in this arrangement may be in the form of a band adapted to carry the material, or it may consist of ropes or chains connected by transverse parts adapted to cause the material to travel over a relatively fixed surface. Where two or more conveying devices are used they may be driven at different velocities.

In another arrangement the trimming device comprises a shoot and band the one being arranged to deliver by gravity onto the other which carries the material forward and delivers it at the required place, the whole being suitably suspended as before and the band being driven, where necessary, by a self contained motor, and being capable when desirable of movement relatively to the shoot so that the length of the said device can be varied to suit different requirements. The shoot and band may in some cases be so constructed and arranged that the material

would be allowed to accumulate in the shoot from the lower end of which it would be withdrawn in a regular manner by the band.

The shoots when used alone or in conjunction with a band or bands may be made of a sinuous, zig-zag or other form in side view so as to occupy a comparatively short space horizontally, and exert a retarding action on material passing through them.

Where the velocity of the material would be high in trimming apparatus of the kind hereinbefore mentioned, the discharging end of the apparatus may be so formed as to retard the velocity of the material. To permit of this being done without choking, the material is caused to spread and deliver itself over an increased area.

For this purpose there may be provided at the delivery end of the shoot or band, a retarding and distributing device consisting of a plate the upper surface of which is so shaped as to spread the material delivered upon it and cause it, or some of it, to escape laterally. In some cases this plate, or parts thereof, may be made capable of adjustment relatively to the shoot or band so as to enable the extent of retarding action, or direction of distribution, or both, to be varied.

Where a simple or telescopically arranged shoot is used, its delivery end may be suitably shaped to act as a retarder and distributor in the manner described.

Trimming devices such as hereinbefore described may be flexibly or otherwise connected to an arm or support that is so pivoted to the shoot jointed to the discharging end of the delivery band, that it can turn about a vertical axis. Or the said trimming devices may be suitably connected to a ring supported by and having a circular movement round the shoot nose. To reduce friction, the said ring may work on balls or rollers running in or on a suitable path on the shoot. The arrangement in each case is such that the trimming device can be turned horizontally as required and so that it can if desired be raised and lowered.

In each case the supply hopper may be constructed with a double nose to serve two sets of feeding devices.

The endless bands used in apparatus of the kind hereinbefore described are carried by girders or supports which may be so formed as to impart any desired curvature to the bands; or supporting rollers, or sheaves arranged at intervals may be used for this purpose. Or the bands may carry rollers arranged to run along ways on the girders. A suitable tension may be imparted to the bands either by tension pulleys, or by so forming the girders or supports that a portion of each band will be unsupported from below so that such portion is free to sag and thus exert a tension on the whole band.

Where the fall or inclination of the endless conveying devices in apparatus of the kind herein described is such as to cause the said devices to move under the action of the load carried thereby, a suitable brake is or may be provided to regulate the velocity.

The apparatus hereinbefore described is especially applicable to loading ships for converting the intermittent supply of material produced by tipping or dumping into a continuous flow or stream of material of moderate dimensions, which can be conveniently conducted to and trimmed or stowed for example in a ship's hold with a rapidity and saving of labour that is not possible where large bulks are discharged at intervals direct into the ship.

The apparatus can be adapted in the main or in part to be worked in conjunction with a pontoon or float for the purpose of conveying material from one vessel or lighter to another, or to the shore; also for conveying or transporting material in mining or other works.

Dated this 3rd day of September 1895.

For the Applicant,

W. LLOYD WISE,

46 Lincoln's Inn Fields, London, W.C., Chartered Patent Agent.

COMPLETE SPECIFICATION.

Improvements in Apparatus for Shipping or Transferring Coal and other Materials.

I, JOHN PEARCE ROE, of 150 Leadenhall Street, in the City of London, Engineer, do hereby declare the nature of this invention and in what manner the same is to be performed to be particularly described and ascertained in and by the following statement :—

This invention has for object to enable coal and other material to be shipped or transferred from one place to another in a rapid and continuous manner with the minimum of labour and breakage of material as I shall now proceed to explain by the aid of the accompanying drawings wherein

Figs. 1 2 and 3 show respectively in side elevation, plan and rear elevation, one arrangement of my apparatus suitable for use with low level tracks.

Figs. 4 to 7 inclusive are detail views, to a larger scale, showing modified forms of feeding devices.

Fig. 8 is a side elevation and Fig. 9 a plan showing another arrangement of my apparatus suitable for use with high level tracks.

Fig. 10 is a diagram.

Fig. 11 shows partly in longitudinal section and partly in side elevation, a tipping cradle with movable stops for a waggon thereon, and

Figs. 12 and 13 are cross sectional views showing the stops in their operative and inoperative positions respectively.

Fig. 14 is a part side elevation showing a modified arrangement of stops, and

Figs. 15 and 16 are plans showing respectively the operative and inoperative positions of such stops.

According to my invention the coal or other material (hereinafter referred to as material) is discharged from waggons 1 or other suitable receptacles into a hopper 2 from the bottom of which it is discharged onto an endless travelling band 3, (hereinafter called the delivery band) by which the material is carried to a point whence it can be discharged into the hold of a ship 4 or other place. The capacity of the hopper may advantageously be such that the variation in the level of the material, due to the withdrawal of material from below during the short intervals between the discharge of successive waggons, will be small, so as to thereby reduce the breakage of the material to a minimum. The rate of discharge from the bottom of the hopper is regulated by suitable means which also serve to convey the material from the bottom of the hopper to the delivery band. For this purpose an endless travelling band 5, (hereinafter called for distinction the feeding band) may be used, arranged at the bottom of the hopper 2 (Figs. 1 and 4) in such a manner as to practically form an extension of the hopper bottom. When a band is thus used, it may be arranged to work beneath extensions 2^a of the hopper sides, and is preferably provided with sides flanges 5^a embracing the lower edges of the said hopper extensions so as to prevent escape of small material between such extensions and the band. Or the band 5 may be arranged to pass through an opening 2^b in the lower portion of the hopper, as shown in Fig. 5, so as to pass over the hopper bottom 2^c and between the extensions 2^a of the hopper sides. The feeding band 5 may have a non-perforated bottom, or the said band and the hopper bottom 2^c may be formed with openings to serve as screens for the escape of small material. For driving the feeding band, one of the pulleys 6 around which it passes is arranged to be driven by any suitable means such as an electric or other motor shown diagrammatically at 7. In lieu of a feeding band, an inclined shoot 8 (Figs. 6 and 7) in one or more sections may be used, arranged at the hopper

nose 2^d and having a jig motion that may be adjustable so as to regulate the discharge of material according to requirements. In Fig. 6 the shoot 8 is in one section supported by radius bars 9, 9^a, a jig motion being imparted to it by a connecting rod 10 from an adjustable pin 11 on a suitably driven crank disc 12. In Fig. 7 the shoot is composed of two sections 8, 8^a whereof 8^a is hinged to the nose of the shoot 2 at 8^b and at 8^c to the rear end of the section 8 which is supported upon radius bars 9 and has a jig motion imparted to it from a crank disc 12 as in Fig. 6. When a jig shoot is used, the sides thereof form lateral extensions of the hopper as shown. The arrangement is such that the feeding band or jig shoot, when at rest, forms a toe (indicated by the irregular line A in Fig. 4) of sufficient length to prevent flow of material from the hopper 2 and when the band or shoot is set in motion, the withdrawal of material from the hopper will be proportionate to the speed of the band or shoot and to the cross sectional area of the discharge opening in the hopper, the feeding device (band or shoot) when in motion withdrawing material of small and large size indiscriminately at a regular given rate that can be varied at will, to suit requirement, by adjusting the motion of the said feeding device.

In some cases the feeding band 5 or the jig shoot 8 may, as shown in connection with the shoots in Figs. 6 and 7, be provided with a pivoted flap 13 adapted to be turned upward from the position shown in Fig. 6 to that shown in Fig. 7 to form *inter alia* a stop when the motion of the feeding band or shoot ceases.

As the feeding band or jig shoot would have a depth of material upon it corresponding roughly to the height of the opening in the bottom of the hopper, its speed would be usually comparatively moderate, and to continue the movement of material forward, the feeding band or jig shoot is arranged to deliver onto the delivery band 3 which may advantageously run at a greater velocity and have therefore a reduced thickness of material upon it. By thus making the thickness of material upon the delivery band moderate, the structural scantlings for carrying his band, as hereinafter described, can be proportionately light, thereby enabling the band to be readily adjusted or moved to adapt it to various applications where this power of adjustment would be advantageous, as for example in shipping coal, where it is of importance to be able to move the outer end of the delivery band to various positions over a vessel's hatchways and to provide for differences in level.

The angular or radial adjustment of the delivery band can be effected in various ways.

In the arrangement shown in Fig. 1 the delivery band 3 is mounted to run over pulleys 14, 14^a journalled in girders 15 over which the band travels and which are pivoted at their inner ends at 15^b to admit of vertical turning movement of the band. To permit of horizontal movement, the hopper may be mounted to turn bodily, or it may, as shown in Figs. 1, 3 5 and 8, be made in two parts 2, 2^a that are circular in plan at the line of junction and the lower of which (2^a) together with the feeding and delivery bands 5 and 3 respectively, is made to turn horizontally upon and about a centre 16 the centre of motion in each case corresponding to the centre of the circular portion of the hopper. This arrangement admits of a large radius for horizontal swing, and of a simple construction of driving mechanism, shown diagrammatically at 17, for the delivery band 3, besides keeping the feeding and delivery bands always in line.

The inner end of the delivery band 3 may be so mounted, or supported, as for example on a carriage or slide 18, (Fig. 1) as to enable the band to be run in and out so as to serve for example a wide hatch, and also to permit of its being housed as shown in dotted lines in Fig. 1. The girders 15 carrying the outer portion of the band are jointed at 15^a to the carriage or slide 18 so as to allow for the vertical radial movement of the said outer portion of the band.

In the construction shown in Figs. 1, 2 and 3, the hopper 2, 2^a, feeding band 5 and delivery band 3 are mounted in a frame 19 arranged to travel on ways parallel to a quay wall 20, the lower portion 2^a of the hopper with feeding band 5 and motor 7, carriage or slide 18 with the inner end of the delivery band 3 and the

motor 17 for driving the latter being mounted upon a separate frame 21 pivoted to the frame 19 at 16 so that it can turn horizontally.

In the arrangement shown in Fig. 8, the upper portion of the hopper 2 is carried by a stationary frame 19 and the inner end of the delivery band and adjacent parts are mounted on a frame 21 pivoted at 16 so as to permit of a radial or turning movement over the quay wall 20. The forward end of the frame 21 may as shown in Fig. 5, be supported upon a circular way 22.

The outer ends of the girders 15 supporting the delivery band 3 are or may be supported from a structure by suitable connections operated by hydraulic or other mechanism for effecting and permitting the horizontal and vertical adjustments of the band. In Figs. 1 and 3 the outer end of the delivery band is suspended by ropes or chains 22 23 that are connected to a shoot 24, pivoted to the outer end of the girders 15 and are adapted to be respectively operated by hydraulic motors 22^a 23^a for effecting vertical adjustment of the delivery band and shoot 24. The motors 22^a, 23^a are fixed upon an auxiliary frame 25 pivoted at 25^a to the main frame 19 which is provided with a circular way 19^a on which the auxiliary frame can be moved for the purpose of effecting the horizontal radial movements of the delivery band and shoot 24.

To admit of a number of waggons being quickly discharged one after another into the main hopper, and thereby to avoid the loss of time involved when each empty waggon has to be moved back to a crossing at the rear of the tip, the entering and leaving tracks may be so arranged in relation to the tipping apparatus that each waggon can be moved from the one track to the other by means of a crossing, turntable or traverser located in front of the tip, the arrangement in each case being such as to admit of a waggon after being dumped passing on in the same direction so as to admit of the next waggon to be dumped following immediately in the rear of the first one.

In the arrangement shown in Figs. 8 and 9, suitable for use where the waggons are to be tipped, there is an oscillating cradle 26 to receive and tip each waggon in succession. The cradle may be operated in the usual way either by mechanical power, or by gravity. In the example shown it is pivoted at 26^a and is raised into the dotted position for dumping by the ram of a hydraulic motor 27. For holding the waggon in position for dumping, the cradle is provided according to this invention, with moveable stops 28 against which each waggon takes when in position for tipping, the said stops being so constructed and arranged that they can be caused to swing or otherwise move clear of the waggon to permit of its being passed forward when emptied. In the example shown in Figs. 11 to 13 inclusive, there are two stops 28 each carried by a lever 28^a in the form of a plate mounted to turn about a horizontal axis at 28^b, the lower arms of the two levers being connected by rods to the two arms of a lever 28^c that is fixed upon a shaft 28^d provided with a second lever 28^e by which it can be operated by a hydraulic motor 28^f, or be otherwise operated for the purpose of simultaneously moving the pair of stops 28 into either the operative position (Fig. 12) or the inoperative position (Fig. 13), as may be desired. In the modified arrangement shown in Figs. 14, 15 and 16, the levers 28^a carrying the stops 28 are mounted to turn about vertical axes. After being tipped each waggon may move onward to reverse points and crossing 29 (Fig. 10); or to a turntable 29^a (Fig. 10); or to a traverser 29^b (Figs. 8 & 9) arranged, in either case, in front of the cradle 26 and hopper 2 so that the waggon can be transferred from the track 30 to the track 30^a.

For low level tracks an elevator and drop may be provided whereby the waggons can be lifted at one end of the tip and lowered at the other end thereof after being dumped. The tracks may be arranged either parallel with, or at an angle to the quay wall, and the elevator and drop may be arranged to turn through any desired number of degrees during ascent and descent when the lower tracks do not run in line with those at the high level.

In Figs. 1 to 3 inclusive, 31 and 32 are respectively an elevator and drop each

in the form of a cage adapted to work vertically in guides 33 the raising in each case being effected by a hydraulic motor 34 through a chain 35, and the lowering being effected by gravity. In the arrangement shown, the tracks 30, 30ª are arranged at right angles to the quay wall, and the elevator and drop are each turned through a right angle during ascent and descent by fixed spiral guide-ways 36 in which extensions 37 on the elevator and drop work for the purpose of bringing the waggon in the one case into position to run upon the upper track 30ᵇ, which extends across the top of the hopper 2, and in the other case to again bring the waggon into position to be run onto the return track 30ª.

When hopper bottom or other type of self-dumping waggons are used, as shown in Figs. 1, 2 and 3, the tip cradle is dispensed with.

Where a hopper 2 and the other devices hereinbefore described, are carried by a movable frame 19, the tipping or dumping apparatus with traverser, or crossing and points, or turntable, or the elevator and drop, as the case may be, can, as shown in connection with the elevator and drop in Figs. 1, 2 and 3, be mounted on the said frame so that the whole can be moved together.

Various means may be provided for conducting or distributing the stream of material in any desired direction and to any desired place after it leaves the end of the delivery band. For this purpose a curved or other shaped shoot or guide (hereinafter called a delivery shoot) may be used, jointed in such a manner as to admit of vertical adjustment by any suitable means. This delivery shoot may be of various shapes.

In Fig. 17, there is shown a straight delivery shoot 24 adapted to discharge over its lower end. In Fig. 1, the shoot 24 has a discharge opening in the bottom.

Fig. 18 shows a delivery shoot of the kind represented in Fig. 1, but having mounted thereon a rotary distributing sheet 38ª in a manner hereinafter described.

For distributing or trimming coal or other material, as for example in the hold of a ship, I provide in connection with apparatus, such for example, as that hereinbefore described, adapted to supply material, mechanical trimming devices that can be suspended from a point or points outside a ship's hold, so as to be capable of being readily inserted into, manœuvred within and withdrawn from the ship's hold, and are so constructed and arranged that the material can be delivered fore and aft and athwart ship in such a manner as to avoid impact and breakage as far as possible.

Where the place to which the material is to be delivered is such that the force of gravity will be sufficient to cause the delivery of the material to the required place, the trimming device may be in the form of a curved shoot the entry end of which may be approximately vertical whilst the lower portion is curved in a lateral direction, and may be of such a shape as to considerably reduce the velocity of the material before it finally leaves the shoot. The said shoot may be made in two or more sections capable of moving one over or within the other.

Figs. 19 and 20 are elevations showing two forms of such shoot 44 each provided with suitably arranged eyes 44^a 44^b by which it can be suspended by ropes 44^c, 44^d (Figs 1 1^a) from a jib 42 mounted to turn about a horizontal axis on a pillar 43 (Fig. 1) which is mounted to turn about a vertical axis, the arrangement being such that the trimming device can be suspended from a point outside the ship's hold. By the means described velocity due to gravity is utilized, in conjunction with guiding surfaces, to gradually change the direction of flow of material from the vertical to the desired direction, at the same time reducing impact.

Fig. 21 shows another arrangement of trimming device comprising an endless conveying band 45 driven where necessary by a self contained motor, and arranged to pass over drums 46 carried by light girders 47 which are telescopically mounted in relation to other girders 47^a, the device being suspended by the ropes 44^c 44^d so that it can be conveniently adjusted to suitable heights and positions, and the arrangement being such that material delivered upon the receiving end of the

band 45 will be carried forward and delivered where required. The girders 47 may be moved relatively to the girders 47^a by means of a chain 49 connected to the girders 47 and passing over chain wheels 48 which are mounted on the girders 47^a and one of which is arranged to be driven by suitable mechanism 48^a.

Fig. 22 is a side elevation showing another arrangement of trimming device. It comprises a shoot 44 and band 45, the first being arranged to deliver by gravity onto the second which carries the material forward and delivers it at the required place, the whole being suitably suspended as before and the band being driven, where necessary, by a self-contained motor indicated diagrammatically at 50 and being capable (when desirable) of movement relatively to the shoot by means such as that hereinbefore described with reference to Fig. 21 so that the length of the said device can be varied to suit different requirements. Fig. 23 shows an arrangement somewhat similar to Fig. 21 but in which the band 45 has a mean inclination such that it will be automatically moved under the action of the load carried thereby. In this case a suitable brake or regulator may be provided to control the velocity. The girders carrying the band may be provided at the receiving end with a shoot or guide 44 as shown in Fig. 23, or the said band may receive material direct from the delivery apparatus without a shoot or guide being combined with the trimming device, as shown in Fig. 23^A.

The shoot 44 and band 45 may in some cases be constructed and arranged as shown in Fig. 24 so that the material would be allowed to accumulate in the shoot from the lower end of which it would be withdrawn in a regular manner by the band.

The shoot 44 when used alone or in conjunction with a band may be made of a sinuous, zig-zag or other form in side view so as to occupy a comparatively short space horizontally as shown in Fig. 25 and exert a retarding action on material passing through it.

Where the velocity of the material would be high in trimming apparatus of the kind hereinbefore mentioned, the discharging end of the apparatus may be so formed as to retard the velocity of the material. To permit of this being done without choking, the material is allowed to spread and deliver itself over an increased area.

For this purpose there may be provided at the delivery end of the shoot 44 (Figs. 19 and 20) or band 45 (Fig. 26) a retarding and distributing device consisting of a plate 51 constituting in effect a prolongation of the shoot or band and the upper surface of which is so shaped as to spread the material delivered upon it and cause it, or some of it, to escape laterally.

Fig. 27 is a plan of the shoot 44 shown in Fig. 20 provided with one form of such a retarding and distributing device, and Figs. 28 and 29 are cross sections on the lines A A and B B respectively of Fig. 27. In this case the plate 51 is made of enlarged or flaring form, with the lateral portions 51^a inclined downward for the purpose mentioned. The central portion of such a plate may be of concave form in cross section instead of being flat as shown, or it may be of convex form as in Fig. 1.

In some cases the plate 51 may be made capable of adjustment relatively to the shoot or band so as to enable the extent of retarding action, or direction of distribution, or both, to be varied. For this purpose the retarder and distributor 51 may be pivoted at the end of the shoot or band as shown in Figs. 19 and 26 and be arranged to be turned by gearing 52.

The trimming devices shown in Figs. 19 to 29 inclusive may be suspended in a ship's hold by ropes or chains 44^c 44^d, as described with reference to Figs. 1^a 19 and 20 & so as to be independent of the delivery shoot 24. Or such devices may be connected to the shoot 24 as well as to the ropes or chains 44^c 44^d. In this case the upper end of the shoot may be detachably connected by a pin 53 to a ring 54 capable of rotary movement on a ring 55 on the shoot 24, antifriction balls 56 being preferably placed between the two rings as shown in side elevation and cross section respectively in Figs. 30 and 31.

The endless bands used in apparatus of the kind hereinbefore described may be supported between the end guide rollers and have a suitable tension imparted to them, in any known or suitable way.

The apparatus hereinbefore described is especially applicable to loading ships for converting the intermittent supply of material produced by tipping or dumping into a continuous flow or stream of material of moderate dimensions, which can be conveniently conducted to and trimmed or stowed for example in a ship's hold with a rapidity and saving of labour that is not possible where large bulks are discharged at intervals direct into the ship.

The apparatus can be adapted in the main or in part to be worked in conjunction with a pontoon or float for the purpose of conveying material from one vessel or lighter to another, or to the shore; also for conveying or transporting material in mining or other works as shown for example in Fig. 32 when the delivery band 3 is represented as working down a hill slope for delivery into waggons or other receptacles. In the example shown, the delivery band will be driven by the load and in turn drive the feeding band 5; a brake may be provided for controlling the rate of delivery.

Having now particularly described and ascertained the nature of the said invention and in what manner the same is to be performed I declare that what I claim is:—

1. Apparatus for shipping or transferring coal and other materials comprising a hopper, a delivery band, and a feeding device such as an endless band or jig shoot, located between the hopper and delivery band, the arrangement being such that material fed into the hopper can be withdrawn from the bottom of the latter and discharged upon the delivery band by which it can be delivered into the hold of a ship or other place substantially as described.

2. Apparatus of the kind referred to in the preceding claim wherein the girders or supports carrying the delivery band are pivoted at their inner ends to turn about a horizontal axis, and the hopper, or the lower portion thereof, together with the feeding device and delivery band, is mounted to turn about a vertical axis, the arrangement being such as to admit of the discharging end of the delivery band being adjusted both vertically and horizontally, substantially as herein described.

3. Mounting apparatus of the kind referred to in the preceding claims in a main frame or structure and supporting the discharging end of the delivery band by an auxiliary frame capable of radial movement and provided with means whereby the position of the said end of the delivery band can be varied to suit requirement, substantially as described.

4. In apparatus of the kind referred to in the preceding claims, mounting the inner end of the delivery band upon a movable support below the feeding device so that the delivery band can be run in and out substantially as hereinbefore described for the purposes specified.

5. In apparatus of the kind referred to in the preceding claims, feeding devices constructed and operating substantially as hereinbefore described with reference respectively to and shown in Fig. 4; in Fig. 5; in Fig. 6; and in Fig. 7 of the accompanying drawings.

6. In apparatus for shipping or transferring coal and other materials, the arrangement in connection with an entering track provided with a tip, and a leaving track, of means such as a crossing and points, or a turntable, or a traverser, arranged in front of the tip whereby a waggon after being dumped can pass on in the forward direction on the entering line and be then transferred to the leaving line so as to admit of the next waggon to be dumped following immediately in the rear of the first one, substantially as described.

7. In an arrangement of the kind referred to in the preceding claim, providing in connection with an oscillating cradle adapted to tip a waggon endway movable stops adapted to be moved into position to hold a waggon on the cradle during end tipping and to be afterwards moved clear of the waggon to permit the same to

move forward, substantially as hereinbefore described with reference to Figs. 11 to 16 inclusive of the drawings annexed.

8. In apparatus for shipping or transferring coal and other materials, the combination with low level tracks and a raised tip and hopper, of an elevator and drop whereby waggons can be raised at one end of the tip and after being dumped can be moved forward and lowered at the other end of the tip, means being provided for automatically turning the elevator and drop during ascent and descent when the lower tracks do not run in line with that at the higher level, substantially as described.

9. The combination with apparatus of the kind referred to in Claims 1 to 4 inclusive for shipping coal and other material, of a trimming device suspended below the delivery end of the apparatus from points outside the ship's hold so as to be capable of being readily inserted into, manœuvred within and withdrawn from a ship's hold and whereby coal or other material supplied by the said apparatus can be delivered fore and aft and athwart ship, substantially as described for the purpose specified.

10. In apparatus for shipping coal or other material a mechanical trimming device comprising an endless band passing over rollers carried by girders adapted to be suspended in a ship's hold from a point outside the same, whether or not the said girders be carried by other girders in relation to which the first mentioned girders can be moved telescopically, the arrangement being such that material fed upon the band will be carried forward thereby and delivered where required, substantially as described.

11. In apparatus for shipping coal and other material, a mechanical trimming device adapted to be suspended in a ship's hold as referred to in Claim 9 and comprising a combined shoot and endless band the one being arranged to deliver material by gravity onto the other which carries the material forward and delivers it at the required place, substantially as herein described, whether or not a motor be provided for driving the band, and whether or not the shoot and band be relatively movable for varying the length of the said device.

12. The combination with a mechanical trimming device of the kind herein referred to, of a retarding and distributing device consisting of a plate the upper surface of which is so shaped as to retard and spread material passing over it substantially as herein described for the purpose specified.

13. In apparatus of the kind referred to, the combination with a delivery band and a shoot or guide jointed to the delivery end of the girders carrying the said band, of a mechanical trimming device mounted upon the discharging end of the said shoot or guide so that it can be turned around the same, substantially as hereinbefore described with reference to Figs. 30 and 31 of the accompanying drawings, for the purpose specified.

14. My improved apparatus for shipping or transferring coal and other material, constructed arranged and operating substantially as hereinbefore described with reference to and shown in Figs. 1, 2 and 3; in Figs. 8, 9 and 10; and in Fig. 32 of the accompanying drawings.

15. My improved mechanical trimming devices constructed, arranged and operating substantially as hereinbefore described with reference to and shown in Fig. 19 in Figs. 20, 27, 28 and 29; in Figs. 21, 22, 23 and 23A whether modified according to Fig. 26 or not; in Fig. 24; and in Fig. 25 of the accompanying drawings.

Dated this 3rd day of June 1896.

For the Applicant,

W. LLOYD WISE,

46 Lincoln's Inn Fields, London, W.C., Chartered Patent Agent.

Redhill: Printed for His Majesty's Stationery Office, by Love & Malcomson, Ltd.

[G. 7984—50—6/1904.]

Fig. 1.

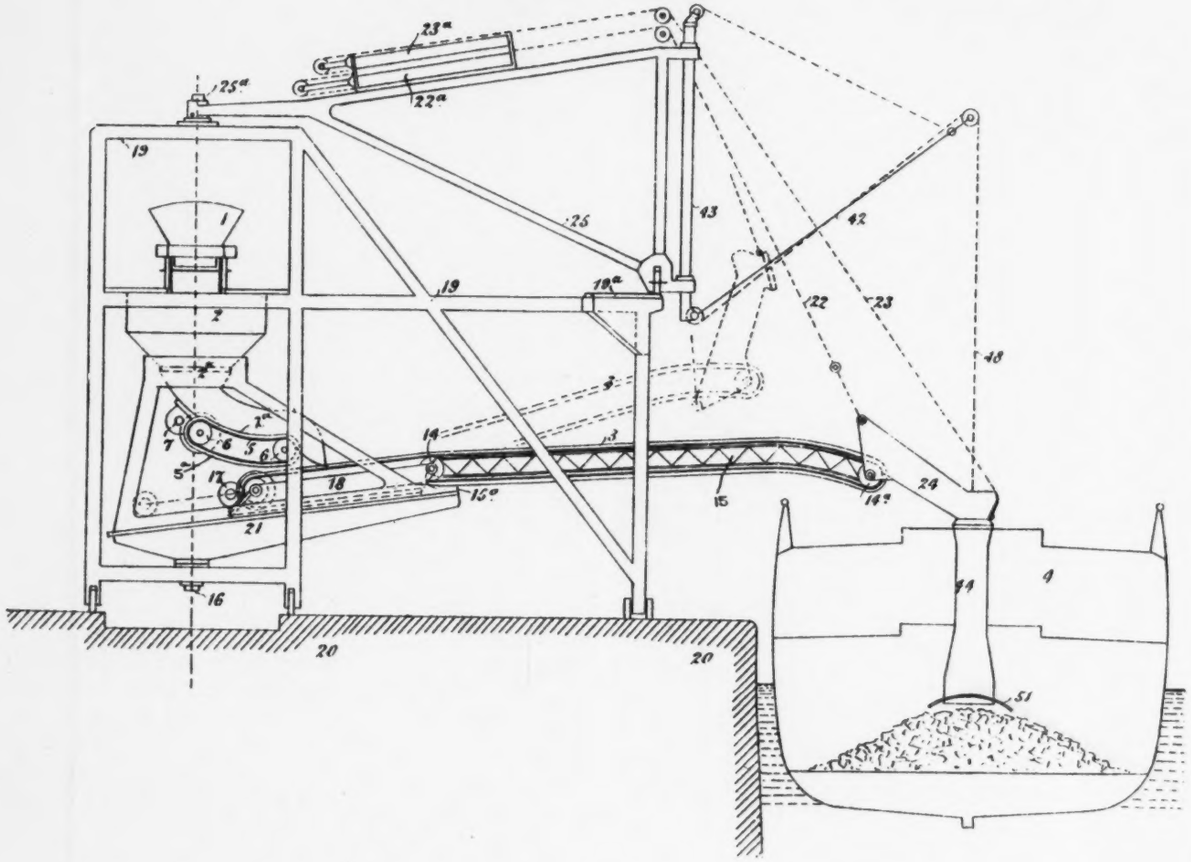
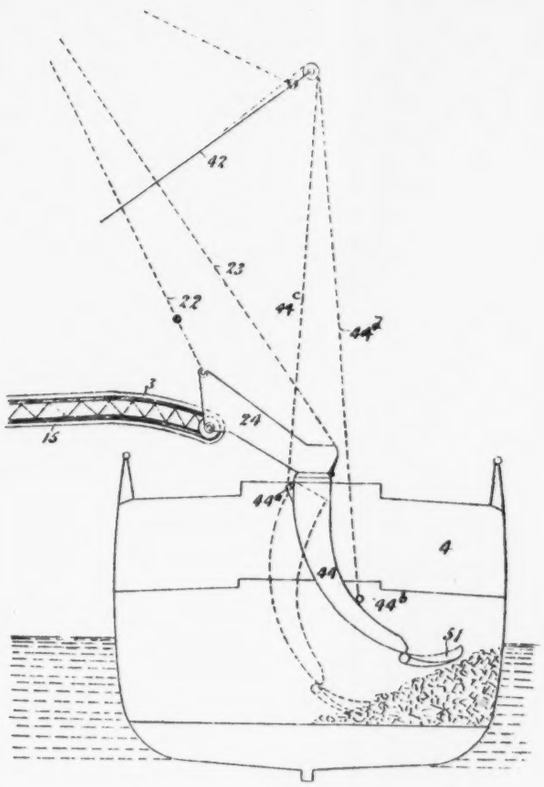


Fig. 1a.



[This Drawing is a reproduction of the Original on a reduced scale.]

A.D. 1895. Sep. 3. Nº 16,525.
ROE'S COMPLETE SPECIFICATION.

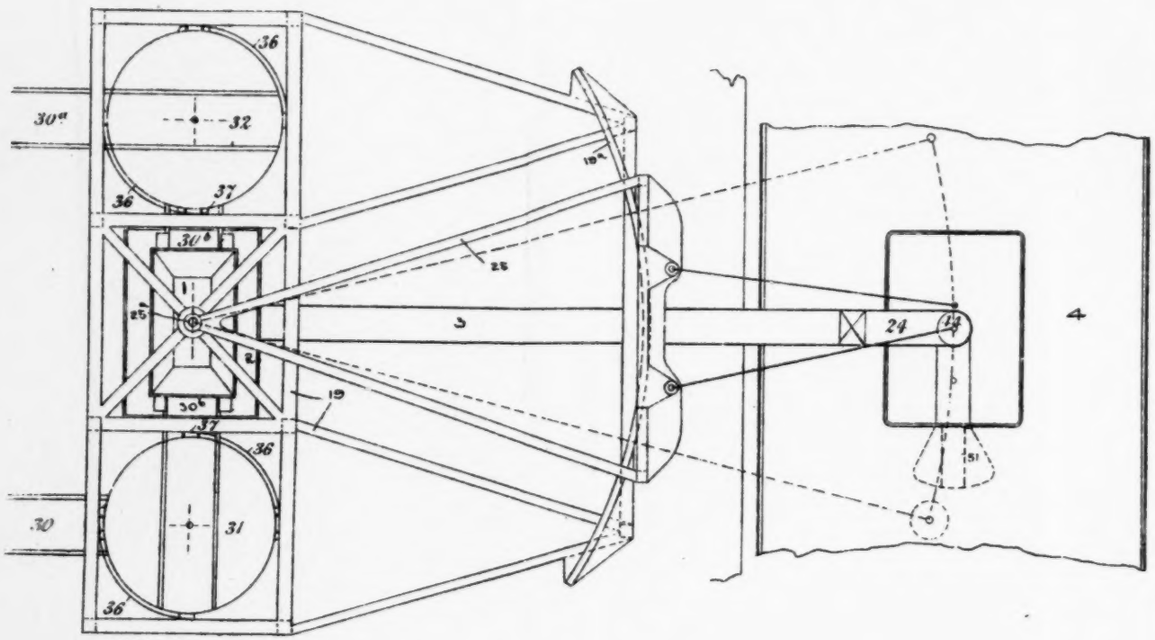
919

597–598
(10 SHEETS)

(2nd Edition)

SHEET 3.

Fig 2



SHEET 4.

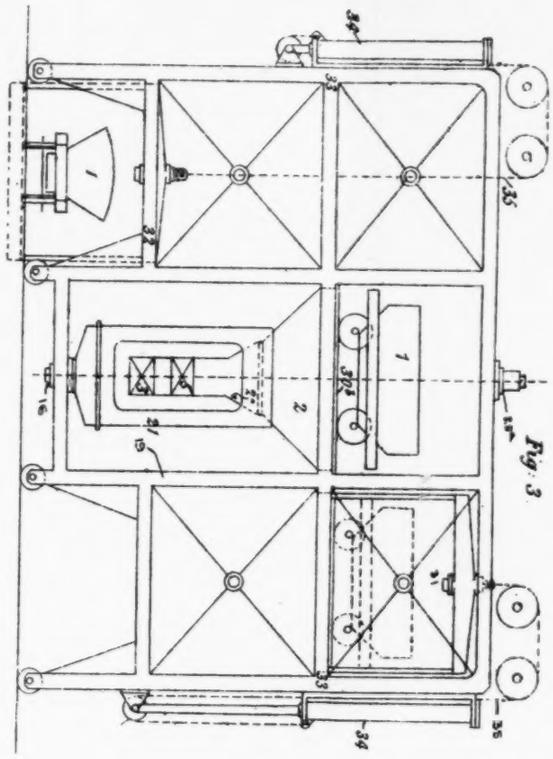


Fig 3

[This Drawing is a reproduction of the Original on a reduced scale]

320
599–600
(10 SHEETS)

Fig: 4

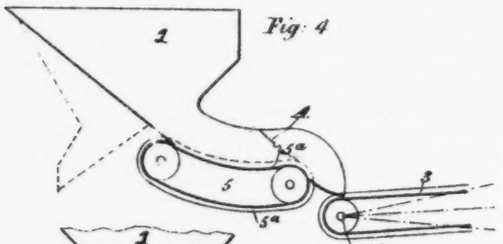


Fig: 5

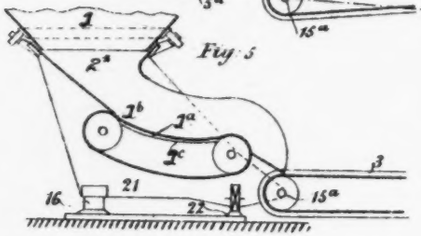


Fig: 6

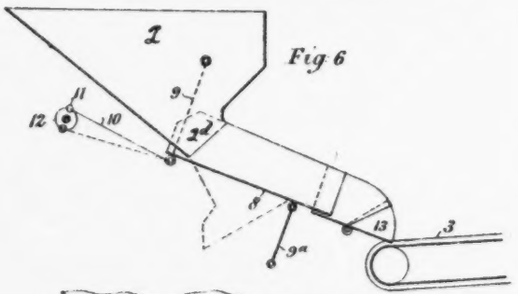


Fig: 7

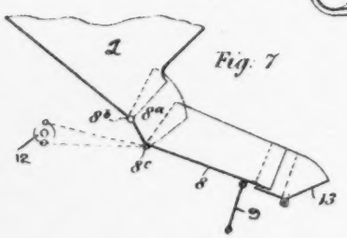


Fig: 10.

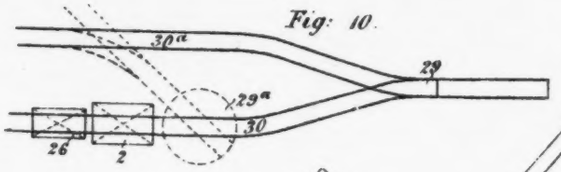


Fig: 8.

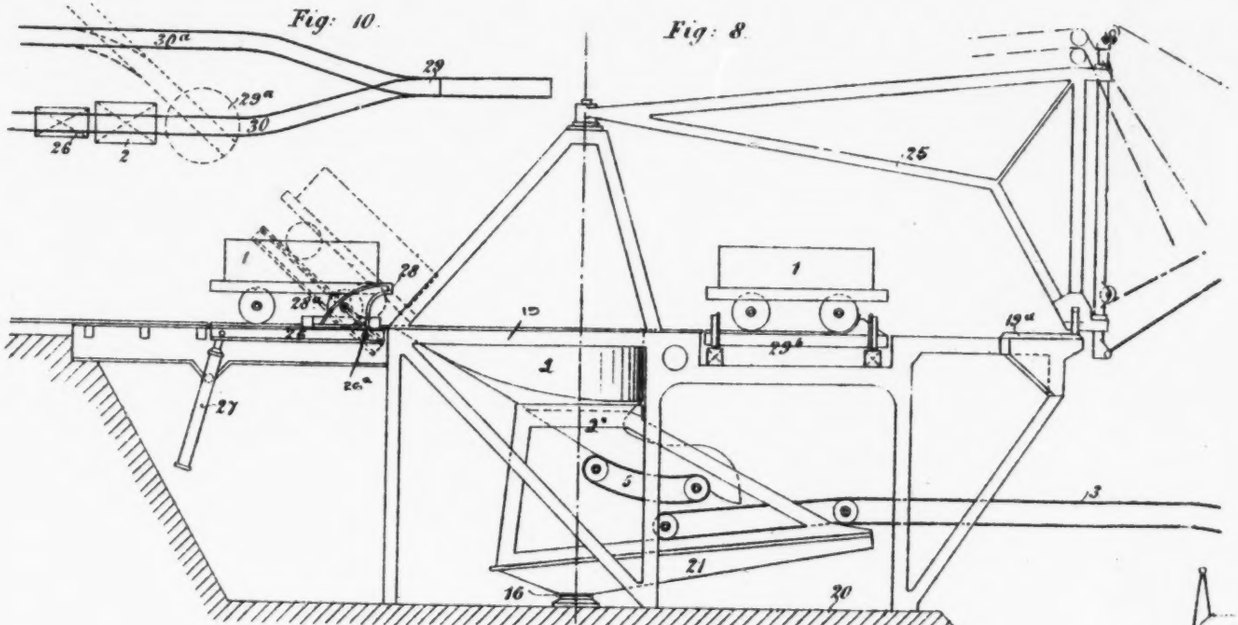
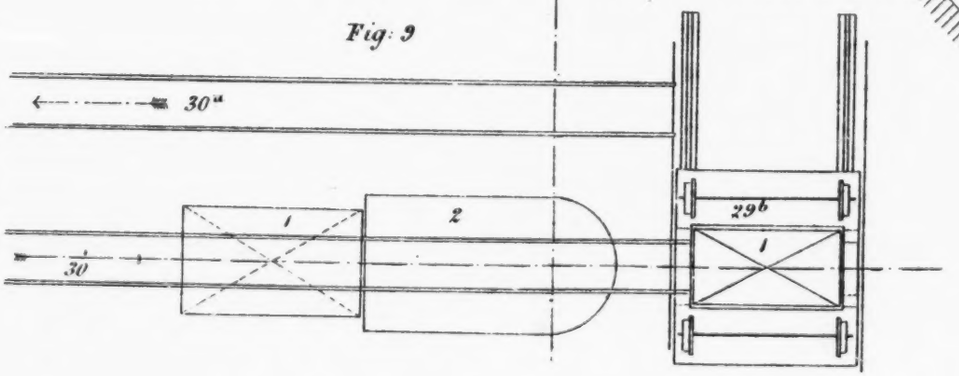


Fig: 9



[This Drawing is a reproduction of the Original on a reduced scale.]

Malby & Sons, Photo-Litho.

Fig. 17.

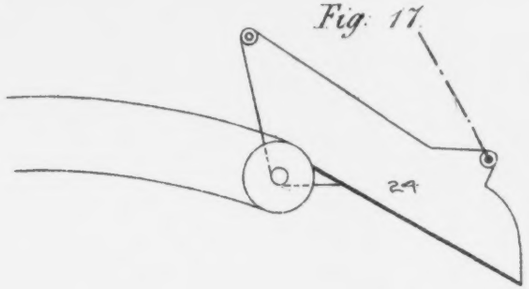


Fig. 18.

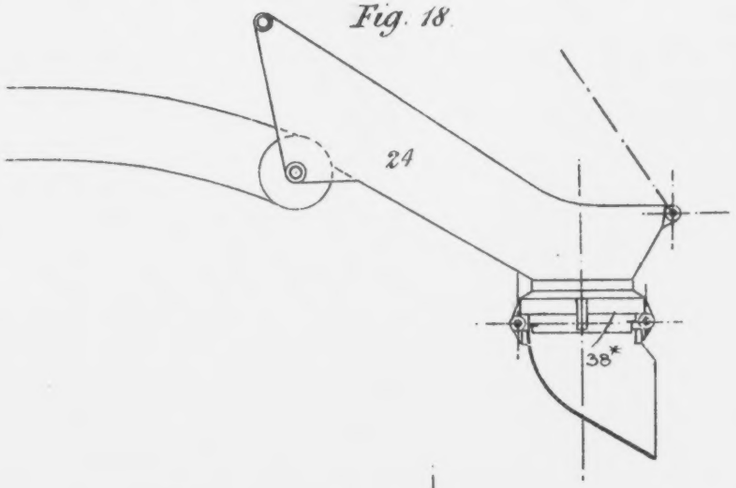


Fig. 30.

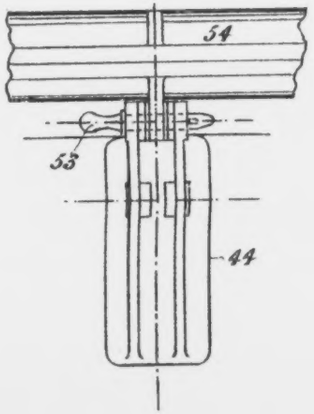


Fig. 31.

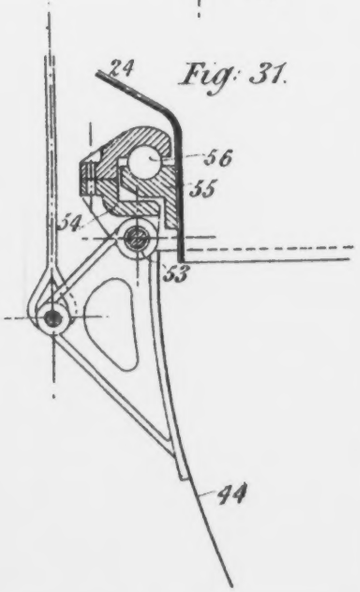


Fig. 11.

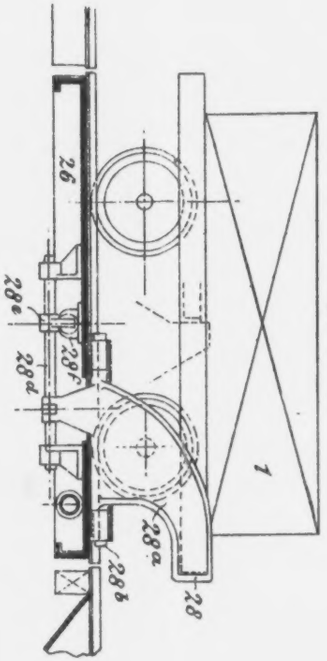


Fig. 14.

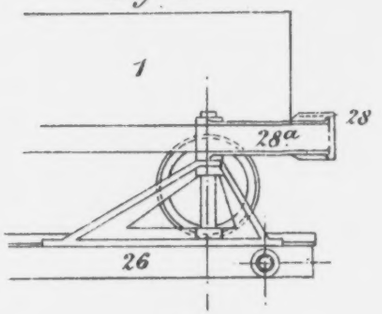


Fig. 15.

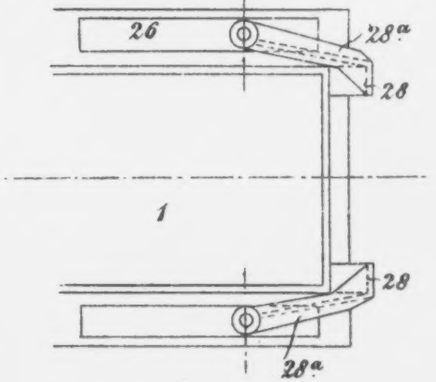


Fig. 12.

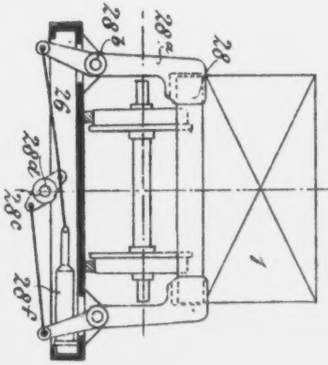


Fig. 16.

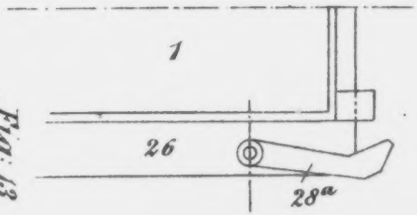
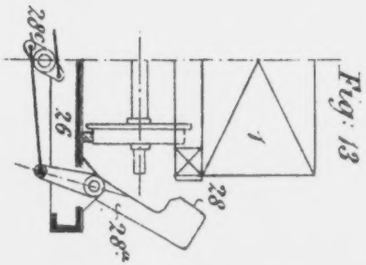


Fig. 13.



[This Drawing is a reproduction of the Original on a reduced scale.]

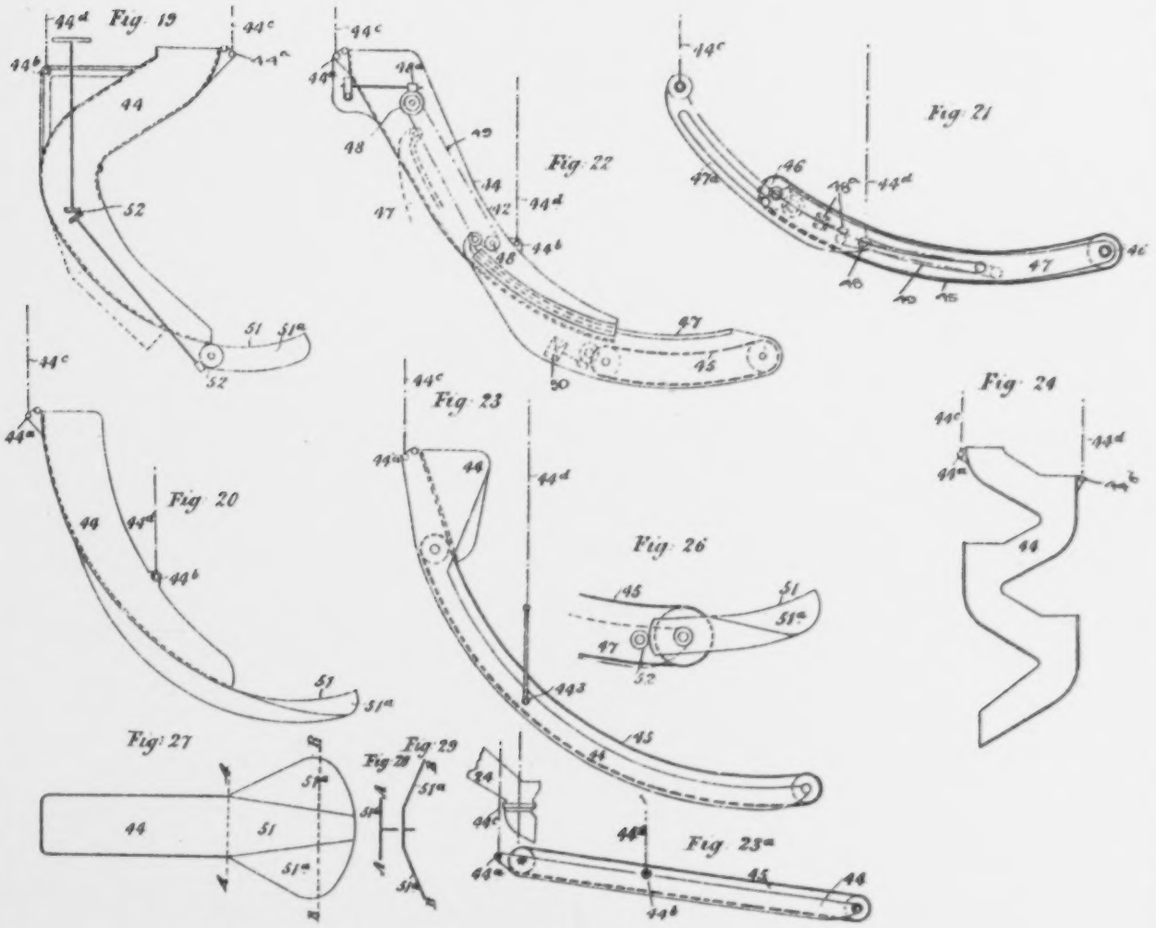
Malby & Sons, Photo-Lith.

D. 1895. Sep. 3. N° 16,535.
S Complete Specification.
(2nd Edition)

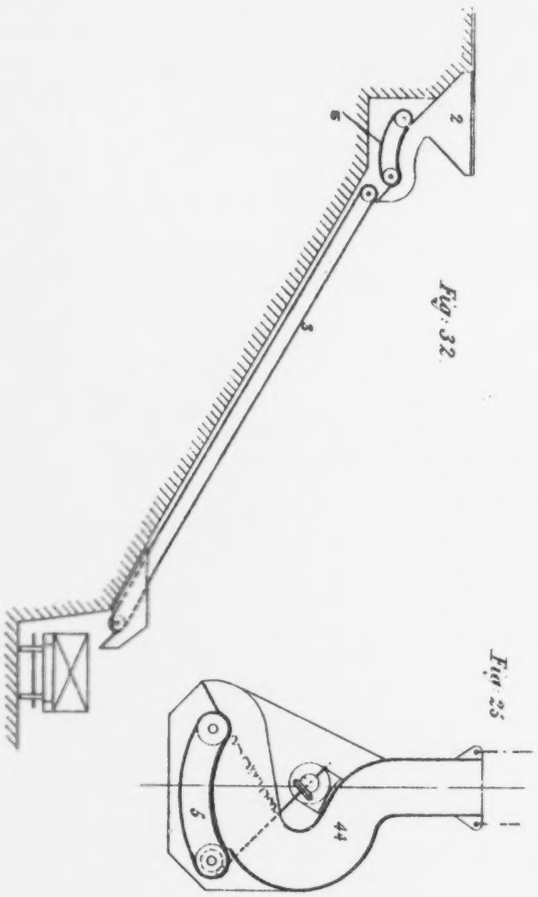
603–604
(10 SHEETS)

922

SHEET 9.



SHEET 10.



[This Drawing is a reproduction of the Original on a reduced scale]

Malby & Sons, Photo-Litho.

[Second Edition.]

923

605–606

N° 19,554 A.D. 1903

Date of Application, 10th Sept., 1903—Accepted, 15th Oct., 1903

COMPLETE SPECIFICATION.

An Apparatus for Distributing Cargoes in a Vessel's Hold or other Places."

We, GERALD EDWARD HOLLAND, C.I.E, D.S.O. Commander, Royal Indian Marine, Principal Port Officer, Burma, and HENRY JOHNSTON, Chief Engineer, Royal Indian Marine, Government Superintending Engineer, and Shipwright Surveyor to the Port of Rangoon, Burma, do hereby declare the nature of this invention and in what manner the same is to be performed to be particularly described and ascertained in and by the following statement :—

This invention relates to a labour saving apparatus for use in conjunction with coal and bag heavers for mechanically distributing in a vessel's hold the cargoes loaded by them.

In the accompanying drawings, Fig. 1 is a cross section of a vessel fitted with our cargo distributor. Fig. 2 shews the distributor when not in use, and Fig. 3 is a plan of the distributor.

A receptacle A built of light steel plating or other suitable material is fitted with a revolving tube B in the bottom, attached to which is a telescopic shoot C as shewn in Fig. 1, the length of which can be regulated as required.

The revolving tube allows the shoot to be pointed in any direction, and the telescopic arrangement of the latter enables the cargo to be delivered into any part of the ship's hold.

A shoot D serves to convey the coal or other material from the delivery end F of the heaver to the receptacle A of the distributor.

In cases where the top deck is planked over, a small hatch E is fitted as shewn in Fig. 1, when the distributor is at work.

By this apparatus a cheap, rapid and labour saving method of loading or placing cargoes in a vessel's hold is obtained.

The method of working the apparatus is very simple and easily understood. The cargo first passes through the shoot D, which is so inclined that the cargo by its own weight falls into the receptacle A and thence into the revolving tube B, from which it passes into the telescopic shoot C, and so into the ship's hold into its required place.

Having now particularly described and ascertained the nature of our said invention and in what manner the same is to be performed, we declare that what we claim is :—

A cargo distributor, consisting of a receptacle, a revolving tube and a telescopic shoot constructed and operating substantially as described.

Dated this 10th day of September 1903.

ABEL & IMRAY,
Agents for the Applicants.

Hereford : Printed for His Majesty's Stationery Office, by The Hereford Times Ltd.
[Wt. 55—25/11/1920.]

[*Price* 1*s.*]

A.D. 1903. Sept. 10, No. 19,554.
HOLLAND & another's Complete Specification.

607–608
(1 SHEET)

(2nd Edition)

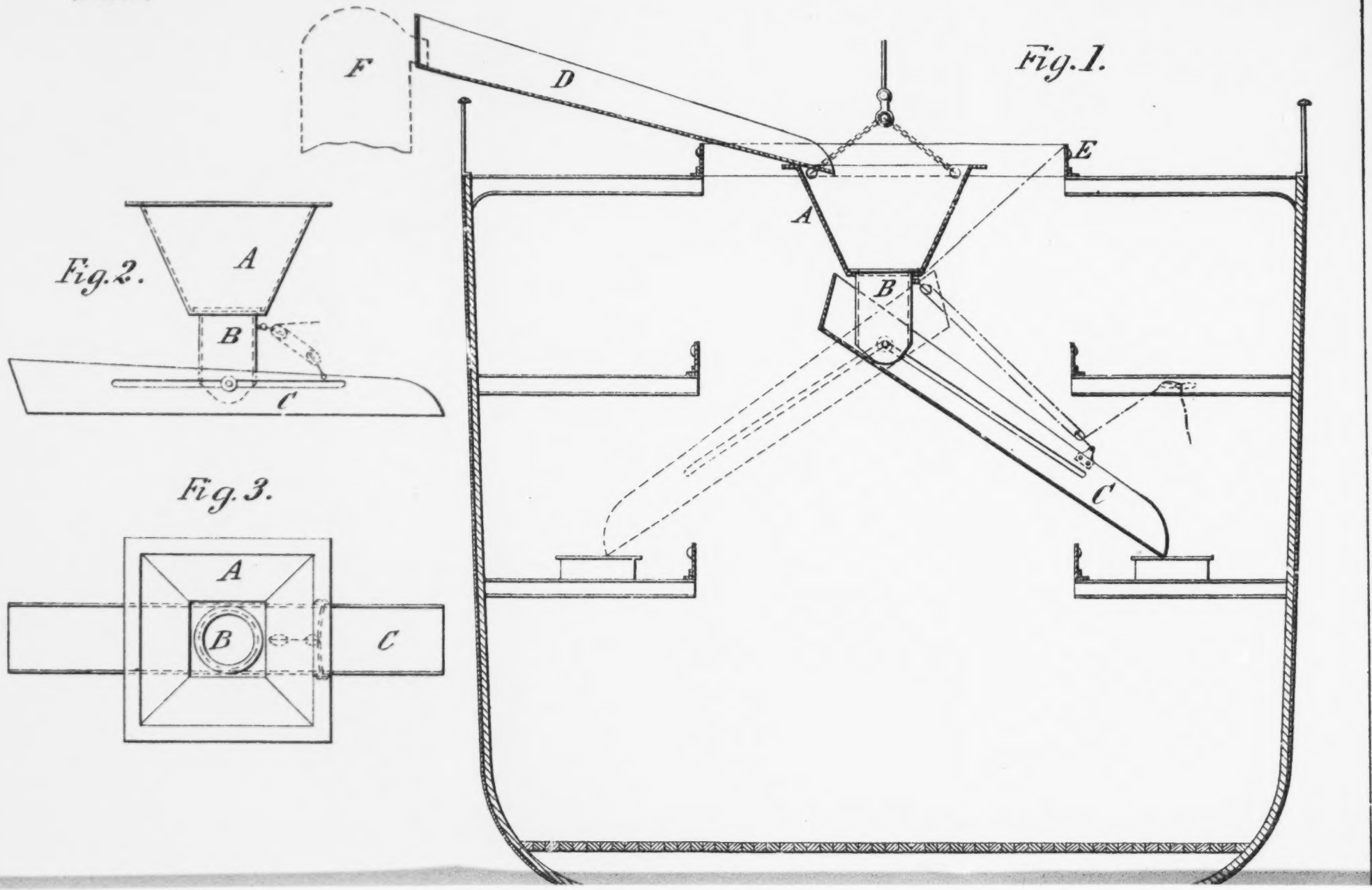


Fig. 1.

Fig. 2.

Fig. 3.

[This Drawing is a reproduction of the Original on a reduced scale]

925
609

N° 7307 A.D. 1908

Date of Application, 2nd Apr., 1908
Complete Specification Left, 7th Aug., 1908—Accepted, 1st Apr., 1909

PROVISIONAL SPECIFICATION.

"Improvements in Apparatus for Laying Concrete"

We, ALEXANDER GIBB, of Goytrey House, Pontypool, Monmouthshire, Civil Engineer, and THOMAS GRAHAM MENZIES, of 130 Wellesley Road, Chiswick, London, Civil Engineer, do hereby declare the nature of this invention to be as follows:—

The present invention has reference to apparatus for the use of contractors and others employed in work where a large amount of concreting is to be done, as for instance, in making dock walls and the like and the object of the invention is to provide means whereby the work can be carried out more expeditiously than heretofore.

In work of this description it is usual to employ appliances for the excavation and removal of the soil and for the delivery of concrete to the trench.

To save time the concreting appliances are made to follow up the excavators as closely as possible but there is much delay owing to stoppages in one department to make way for the other to proceed. For instance, in certain cases the mixer of the concreting appliance cannot be continuously fed when the supply wagons have to stand aside while wagons of excavated earth are being removed.

According to this invention the excavating and concreting appliances are so arranged that the work of each can proceed continuously without clashing with the operation of the other.

In carrying our invention into effect we lay alongside the place to be concreted a line of rail upon which moves the excavators or the cranes for raising the soil dug out of the trench. Straddling this second line of rail is a track for the concreting machine which is supported on a carriage designed to pass over loaded trucks without touching them. At the back of the track of the concreting machine is a track for the trucks which bring supplies for the same and between this track last named and the concreting machine track is a small parallel track for the specially designed feeding appliance of the concreting machine which appliance moves to and fro with the latter as it works up and down the track during the progress of the work. It may here be convenient to note that the cranes being on one track, the trucks on another, the concreting machine on a third, straddling the trucks, and the second set of trucks for bringing supplies to the concreting machine on a fourth track, all these can pass to and fro without coming into conflict and delaying each other. The concreting machine which we employ is in some respects similar to such machines already in use in that it comprises a mixer of any suitable construction and a telescopic shoot for discharging the mixed concrete into the place required. This telescopic shoot we propose to mount in such a way that it can be adjusted to any required elevation within limits and we also propose to provide an elevating bucket by means of which the concrete may be lifted from the level of the mixer and delivered to the said shoot when the latter is working in its higher positions. The mixer is fed by a system of buckets working vertically and these buckets are kept supplied by the feeding appliance located on the track above referred to. This feeding appliance consists of a wheeled carriage attached to and moving with the concreting machine. Upon the carriage are a number of measuring hoppers

[illegible]

PRICE 1/-

which can be filled with the ingredients of the concrete from the supply trucks alongside. Beneath the measuring hoppers are travelling belts working towards a central point where the vertical system of buckets above mentioned is situated. Men are continuously employed filling the measuring hoppers which are discharged onto the travelling belts so that the feed of the mixer is kept constantly supplied. By avoiding the necessity of stopping the work in one department for the convenience of another and by keeping the concrete mixer constantly fed a great improvement in the speed of carrying out the work can be effected.

Dated this 2nd day of April, 1908.

NEWTON & SON,
6, Bream's Buildings, Chancery Lane, London, E.C.
Agents for the Applicants.

COMPLETE SPECIFICATION.

"Improvements in Apparatus for Laying Concrete."

We, ALEXANDER GIBB, of Goytrey House, Pontypool, Monmouthshire, Civil Engineer, and THOMAS GRAHAM MENZIES, of 130 Wellesley Road, Chiswick, London, Civil Engineer, do hereby declare the nature of this invention and in what manner the same is to be performed, to be particularly described and ascertained in and by the following statement:—

The present invention has reference to apparatus for the use of contractors and others employed in work where a large amount of concreting is to be done, as for instance, in making dock walls and the like and the object of the invention is to provide means whereby the work can be carried out more expeditiously than heretofore.

In work of this description it is usual to employ appliances for the excavation and removal of the soil for the supply of building material, brick, stone, and the like, and for the delivery of concrete to the trench.

To save time the concreting appliances are made to follow up the excavators and building appliances as closely as possible but there is much delay owing to stoppages in one department to make way for the other to proceed. For instance in certain cases the mixer of the concreting appliance cannot be continuously fed when the supply wagons have to stand aside while wagons for the excavators and builders are being served.

According to this invention the excavating, concreting, and building appliances are so arranged that the work of each can proceed continuously without clashing with the operations of the other.

In carrying our invention into effect we lay alongside the place to be concreted a line of rail upon which move the excavators or the cranes for handling the soil or building materials, parallel with this line and behind the same is another for the trucks which are to receive the soil dug out of the trench or to feed building materials. Straddling this second line of rail is a track for the concreting machine which is supported on a carriage designed to pass over loaded trucks and locomotives without touching them. At the back of the track of the concreting machine is a track for the trucks which bring supplies for the same and between this track last named and the concreting machine

track is a parallel track for the specially designed feeding appliance of the concreting machine which appliance moves to and fro with the latter as it works up and down the track during the progress of the work. Instead of arranging the track for the feeding appliance or conveyor between the concreting machine track and the track of the supply trucks, the former may be arranged if preferred between the lines of the supply truck track, and contents of the trucks may be discharged on to the feeding appliance through trap doors or their equivalent in the said trucks. It may here be convenient to note that the cranes being on one track, the trucks on another, the concreting machine on a third, straddling the trucks, and the second set of trucks for bringing supplies to the concreting machine on a fourth track, all these can pass to and fro without coming into conflict and delaying each other. The concreting machine which we employ is in some respects similar to such machines already in use in that it comprises a mixer of any suitable construction and a telescopic shoot for discharging the mixed concrete into the place required. This telescopic shoot we propose to mount in such a way that it can be adjusted to any required elevation within limits and we also propose to provide an elevating bucket by means of which the concrete may be lifted from the level of the mixer and delivered to the said shoot when the latter is working in its higher positions. The mixer is fed by a system of buckets working vertically and these buckets are kept supplied by the feeding appliance located on the track above referred to and arranged so as to be accessible to a number of men shovelling material on to it simultaneously at a number of different points. This feeding appliance consists of a wheeled carriage attached to the to and moving with the concreting machine. Upon the carriage are a number of measuring hoppers which can be filled with the ingredients of the concrete from the supply trucks alongside. Beneath the measuring hoppers are travelling belts working towards a central point where the vertical system of buckets above mentioned is situated. Men are continuously employed filling the measuring hoppers which are discharged onto the travelling belts so that the feed of the mixer is kept constantly supplied. By avoiding the necessity of stopping the work in one department for the convenience of another and by keeping the concrete mixer constantly fed a great improvement in the speed of carrying out the work can be effected.

In the accompanying drawings a form of the machine is illustrated in which:—

Fig. 1 shews diagramatically in end elevation an apparatus suitable for building a dock wall of concrete according to the system of the present invention.

Fig. 2 is a side view, and

Fig. 3 is a plan,

Fig. 4 is an end view of the apparatus drawn on a larger scale and in greater detail.

Fig. 5 is a back view of the concreting machine and feeding appliances and supply conveyor,

Fig. 6 shews still more enlarged, and in greater detail, the means for feeding and manipulating the discharge shoot when in the higher positions,

Fig. 7 is a detached view of the bucket which feeds the shoot in the higher positions taken at right angles to the view of Fig. 6,

Fig. 8 is a cross section on the line A A of Fig. 5 enlarged, of the conveyor,

Figs. 9 & 10 are front and side views in detail of the mixer feeding bucket guides.

Fig. 11 is an enlarged front view of the discharge shoot shewing the tackle for moving it up and down.

a is the trench alongside which runs the track *b* for the excavating appliances which may comprise cranes *c*. Next the track *b* is a wide track *d* on which runs the carriage of the concreting machine, which will be described hereafter in greater detail. Between the rails of the track *d* is a track *f* of normal gauge,

which takes the trucks brought up to receive the earth excavated from the trench. *g* is a track for the conveyor *h* which is attached to the concreting machine, and *i* is a track for the trucks which bring supplies alongside the conveyor *h*. If desired, and circumstances permit, one or more tracks may be arranged on the opposite side of the trench.

The concreting machine *e* comprises a carriage of any suitable construction supporting an engine and boiler *j*, and a concrete mixer *k* which may be of any approved type. Driving gear is provided for propelling the carriage along its track *d*, and for working the mixer *k*. The engine also supplies the power for driving the belts *l l* of the conveyor *h* by means of chains or their equivalent indicated by dotted lines at *m m*, power for elevating the mixer feeding buckets *n n*, the shoot feeding bucket *o*, and the shoot *p* itself.

To feed the mixer *k* two buckets *n n* are employed which descend alternately into the space between the ends of the divided portions of the conveyor *h* (see Fig. 5). These buckets are manipulated by cords passing over pulleys to winches *q q*. *r r* are guides for the buckets, and *s* is a switch with a forked end (see Figs. 9 & 10) hinged centrally and arranged to engage with each bucket and guide it when filled into its proper channel. Ordinary tipping mechanism for the buckets is provided by which the contents are automatically discharged into the hoppers of the mixer *k*.

The buckets *n n* are kept regularly at work under the control of an attendant who operates clutches wherewith the lifting gear is supplied, and the mixer is kept in constant rotation so as to mix up well the ingredients for concrete supplied to it with water which is supplied to the mixer through a flexible hose from a tank preferably carried on the machine. At intervals the mixer is tipped into the dotted position of Fig. 4 to discharge its contents into the shoot *p*, or if the said shoot is in too high a position as indicated by dotted lines in Fig. 4, into a bucket *o* which is raised by tackle to the proper height and tipped into the shoot *p*. The shoot *p* which is telescopic (see Fig. 6), being composed of several lengths fitting into one another, is fitted to a frame *t* which carries rollers *u* running in contact with angle iron guides carried by the frame of the carriage of the machine *e*.

The weight of the fore end of the shoot is supported by running tackle *v* operated by a winch by means of which the inclination can be easily adjusted. The rear end is fastened to the ends of cords *w* which run over upper pulleys 1 and the barrels of the winch 2, by means of which the shoot may be hauled up and down and fixed at the proper height. The bucket *o* for taking the discharge from the mixer *k* and delivering it to the shoot *p* is balanced in a frame *x* raised and lowered in guides *y* by means of a cord *z* wound on a drum 4. Trip mechanism 5 is fitted to the bucket *o* for tipping the same when it arrives at the proper position for feeding the shoot *p*. The conveyor *h* by means of which the buckets *n n* are charged consists of a pair of frames fastened to the carriage of the machine *e* with which they move to and fro along the track. These frames carry endless belts *l l* which are arranged in any suitable manner and are worked from the engine on the machine *e*. The frames may also carry measuring hoppers 6 by means of which the requisite proportions of sand, shingle, *etc.*, may be measured onto the belt from the supply trucks which are run up alongside. If preferred however the measuring hoppers may be dispensed with and the men in the trucks can throw or guide their contents direct on to the belts in which the sand would come from one direction and the shingle from another and join each other in the bucket *n* where the proportions would be measured by a vertical division while the cement is added by the attendant in the required proportions. To regulate the proportions of the ingredients without the aid of hoppers 6, the attendant will have to watch carefully and regulate the speed of delivery of the belts *l l* by means of his clutches.

In the trench the usual appliances will be used for guiding the concrete

to any part desired (see Fig. 1) where the portable shoot 7 is shewn receiving concrete from the shoot *p*.

Having now particularly described and ascertained the nature of our said invention, and in what manner the same is to be performed, we declare that what we claim is:—

(1) The combination of parallel tracks and apparatus carried thereby for use in excavating and concreting consisting of a track carrying the excavators a track carrying the trucks for removing the excavated material, a track carrying the concreting machine, a conveyor arranged to convey concreting materials to the concreting machine from a plurality of points in a direction parallel to the track, and a track carrying trucks for supplying concreting materials to the conveyor; the whole arranged for the purpose of supplying a concreting machine with materials without delay and without interfering with the removal of excavated material.

2. The combination of a concrete mixer and a conveyor for supplying materials thereto, said conveyor being adapted to be fed with concreting materials and arranged so as to be accessible to a number of men shovelling materials on to it simultaneously at a number of different points.

Dated this 7th day of August 1908.

NEWTON & SON,
6, Bream's Buildings, Chancery Lane, London, E.C.
Agents for the Applicants.

Redhill: Printed for His Majesty's Stationery Office, by Love & Malcomson, Ltd.—1909.

[This Drawing is a reproduction of the Original on a reduced scale.]

Fig. 1

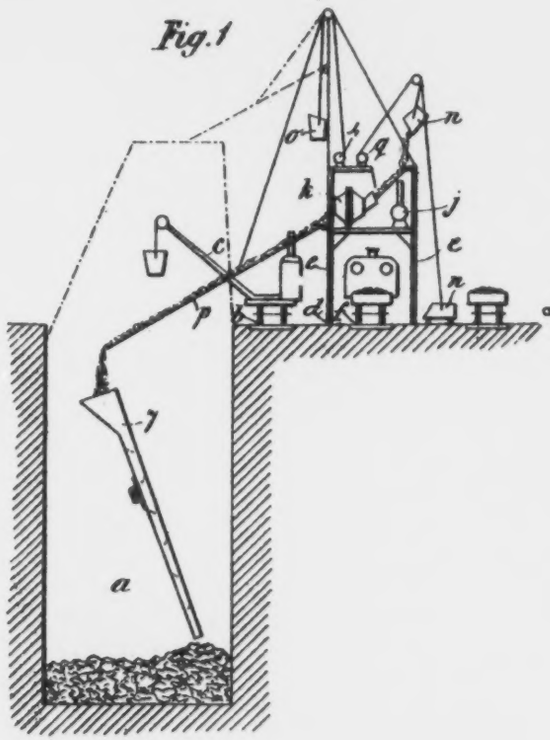


Fig. 2

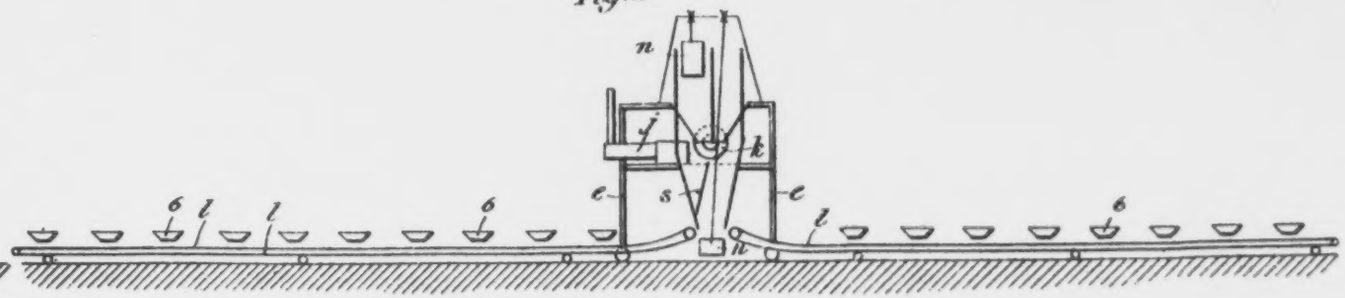
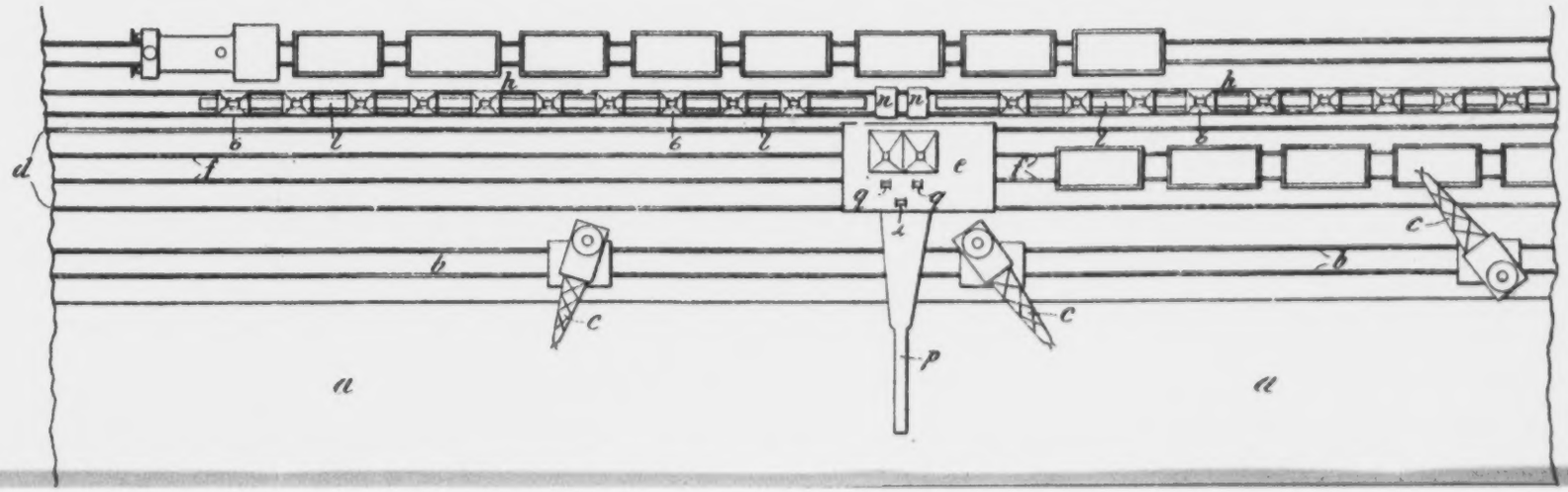


Fig. 3



[This Drawing is a reproduction of the Original on a reduced scale.]

Fig. 6

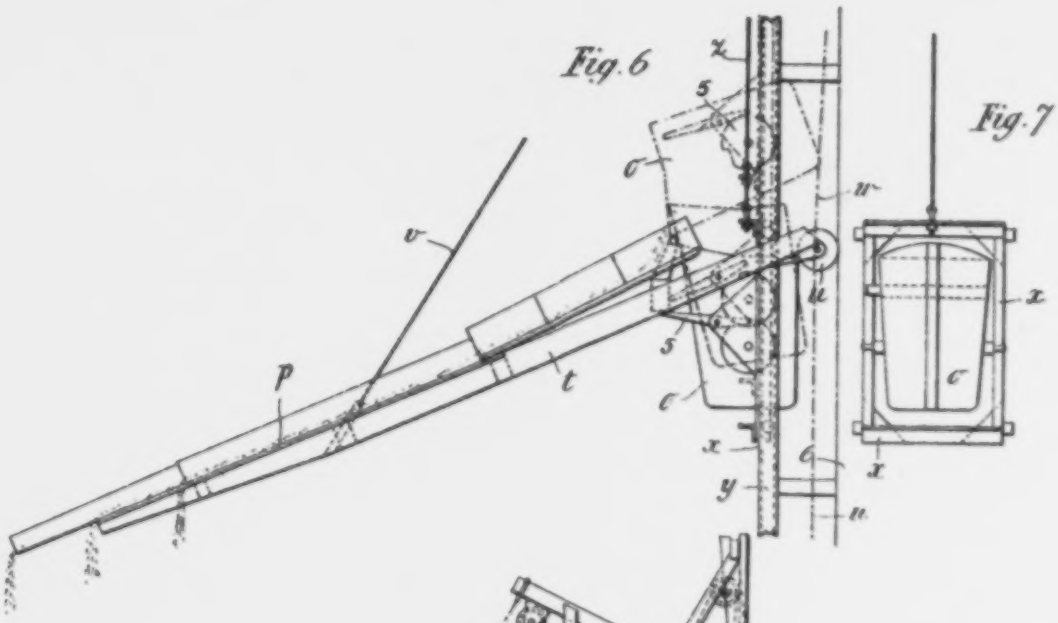


Fig. 7

Fig. 8

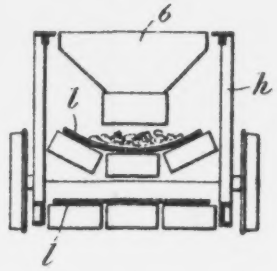


Fig. 4

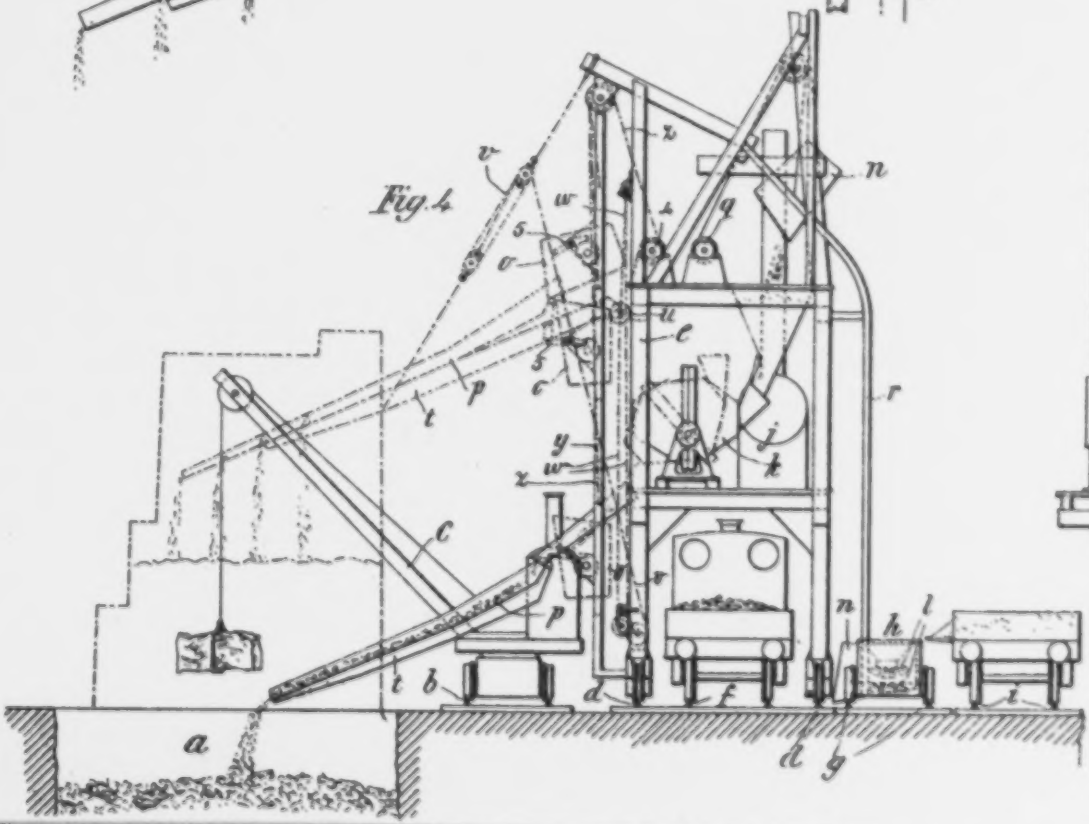


Fig. 5

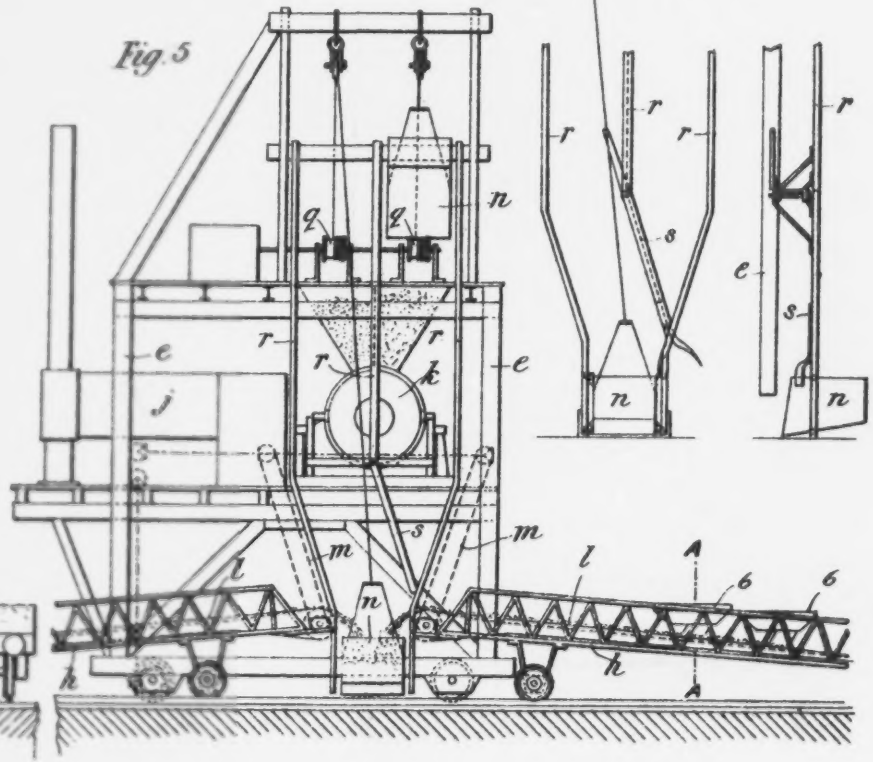


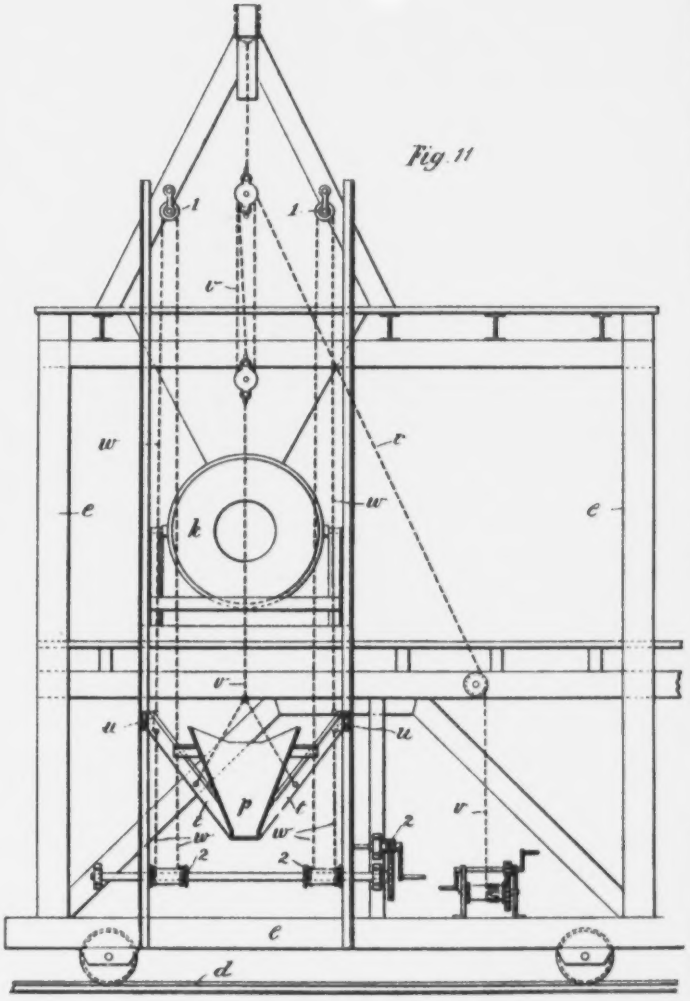
Fig. 9

Fig. 10

619–620
(3 SHEETS)
SHEET 3.

[This Drawing is a reproduction of the Original on a reduced scale.]

Fig. 11



Malby & Sons, Photo-Litho.

[fol. 621] IN UNITED STATES CIRCUIT COURT OF APPEALS FOR THE THIRD CIRCUIT, MARCH TERM, 1923

No. 2982

CONCRETE APPLIANCES COMPANY AND WILLIAM H. INSLEY, Plaintiffs-Appellants,

v.

JOHN E. GOMERY, JOHN C. SCHWARTZ, MICHAEL J. O'MEARA, AND CONCRETE CONSTRUCTION COMPANY, Defendants-Appellees

Appeal from the District Court of the United States for the Eastern District of Pennsylvania

Before Buffington, Woolley, and Davis, Circuit Judges

OPINION OF THE COURT—Filed July 4, 1923

BUFFINGTON, Circuit Judge:

In principle, this case concerns the use of gravity in conveying mobile substances from an elevated common central point to various working points; in application, to the distribution of "wet" or "mush" concrete.

Referring to the above general principle of conveying mobile matter by gravity, we have the age-worn practice of lifting water by power to a reservoir and by gravity distributing it through conduits to a fixed point or by hose to diverse points. In other words, the [fol. 622] problem of lifting it to a gravity-sufficient height; of there accumulating it in storage; from thence conveying it by conduit to a determined place or by hose to an optional point of use. Naturally such general practice was early applied to the movement of such a mobile matter as grain when its volume became large and the word "elevator" became a synonym for the raising, storage and distribution of grain, into individual cars, the ends of the same car, into ships, and indeed into separate hatches.

As an example of the common practice the proof is that prior to 1905 and since then, practically all elevators delivering grain to ships have been equipped with pipes, extending downwardly from the side of the elevator and supported by horizontally movable booms for directing the outlet of the pipes to any desired part of the boat, within range of the apparatus. But not only was such movable conduit's discharge pipe handled by the boom on the elevator, but where the change of the tide or the lower level of the ship, caused by loading, made it desirable, a second or supplemental hopper and an additional spout were suspended from and handled by a boom and tackle on the ship itself. This supplemental hopper received the discharge from the elevator spout and discharged it into the vessel as change of tide or the settling of the vessel necessitated. The proofs further show that where two ships were lying

side by side and it was desired to spout the grain to an outlying, or "second-off" one, it was done by such elevator appliances in spite of the long stretch required. It was also a common practice to provide the spout with a telescopic extension end by which further horizontal reach was effected, due to the varying positions of the ship. Moreover, it will be noted that on such apparatus the function of the boom was not only to raise, lower and swing the spout to [fol. 623] reach the hatches of the ship under different conditions of load and tide, but also to draw up and house the spout so as not to interfere with the navigation or movement of the vessel.

The same general type of grain elevator appliance was used for loading cars. The proof is that "the hopper ends of the spouts were constructed with an enlargement, forming hoppers, and grain spouts were connected to them in the elevators * * * All types of movable and fixed spouts were used in grain elevators at that time, of the movable type, those in the grain elevators were either portable or so constructed that they revolved around a fixed point * * * Outside of the buildings they had spouts for shipping grain to cars, which were generally fixed in position with a telescope and either with one opening or two, so arranged that grain could be thrown into either end of the car." Without further statement, it will be seen that the steps of lifting grain to get gravity; of storing to get quantity; of chuting to get delivery; and of boom swing and trough shift to vary locality of delivery; and also of duplication of these shore appliances by supplemental boom and conduit on shipboard; had all been advanced to a high state of efficiency and delivery point variation in elevator grain practice.

The same may be said of coal practice, the proofs showing the contemporaneous use of "coal chutes in connection with coal elevators in stock piles, where the coal was elevated and spouted out through the side of the building into a stock pile and into bins. The spout would be supported in a similar manner to the spouts heretofore referred to as shipping spouts in connection with grain elevators," that is, "that the spout could swing in any direction and was suspended from a swinging boom."

Later, when concrete docks, piers and the like came to be built, [fol. 624] it was quite natural for contractors to use in building them the apparatus used for grain chuting and to handle and chute concrete in the same way. And such, the proofs show, was the case as will be seen by reference to but one or two operations. In November, 1906, a concrete foundation for an intake and pumping station was built by the Great Lakes Dredge and Dock Company at Gary, Indiana. Here a car was used on which was a mixer from which the concrete was discharged into a hopper or chamber and from which chutes, suspended from a boom located on the car, chuted the mied concrete down to the coffer dam where it flowed either into piles or was poured in place, the dam being some forty feet in width and of great length. The chutes in the apparatus could be moved up, down and sideways. The apparatus was used for several months and was constructed by a man who had never seen concrete so handled, but had seen it used in grain elevators.

In addition to the testimony of the builder of this apparatus, another witness testified as follows:

"The first apparatus we used was a concrete mixer set on a flat car, and the concrete was spouted from the mixer into the bottom of the excavation. We called it chutes then. There was an improvement made on this apparatus to distribute the concrete from one location to another within a radius controlled by a boom holding the chutes or spouts. The ends of the spouts were—the location of the ends of the spouts were placed by swinging the boom that carried the concrete spouts."

The same man the next year used similar apparatus in building a concrete dock at the same place. In this case the apparatus was placed on a scow, a mast being placed in front of a mixer, a boom placed on such mast and a chute suspended by tackle therefrom. [fol. 625] As to its mode of operation, the constructor testified:

"It is dumped out of the mixer into a bucket, and conveyed up with a cable in a bucket, and dumped into a hopper which is fastened on the tower; and we have one 50-foot section of 12-inch pipe carried by two booms and fastened on the bottom of the hopper, and as occasion requires placing concrete in forms, we have 8-foot sections or 10-foot sections to take on or off.

Q. How could you change the point of delivery of the lower end of the pipe?

A. By adding on a section 10 feet long, or taking it off, as occasion required.

Q. Was there any other way to change the point of delivery?

A. By swinging booms and swinging pipe.

Q. Was this apparatus successful?

A. Very successful."

Another witness described it thus:

"This apparatus is a concrete equipment built on a scow, consisting of a concrete mixer at the proper elevation, so that concrete could be spouted into the concrete dock; and above the mixer was constructed two hoppers, one for stone and one for sand, this being at one end and the other end of the scow being the cement shed. A boom was placed to support the chute, for the purpose of raising the spout so that the concrete equipment could be moved—I meant to state for the purpose of spouting the concrete in the forms for the dock, and also to raise the spout when moving the equipment ahead."

He further testified that the number of chute sections used was determined by the distance from the mixer to the concrete forms and that as much as five or six such sections were used on this work and that the dock itself was five thousand feet long.

[fol. 626] There is proof of the use at San Francisco harbor in 1904-5-6 of substantially similar concrete chuting apparatus placed on a scow. It clearly shows the use of chutes moved to different

positions by a boom. A witness thus describing the boom's action said:

"Well, the boom is the bottom end of it, and sets in a hinged socket, I would call it, and the outer end has a sheave in the end of it, the cable runs from the donkey engine to the sheave in the outer end, which is used to handle the pipe that carries the cement to the cylinders. All the use of this boom is to handle the pipe that carries the cement."

Moreover, a study of the proofs satisfy us that from the time concrete came into use there had been a struggle between the architects and designers, who, as a class, favored the use of dry concrete which would not flow, and the contractors, who, for construction convenience favored wet or mush concrete, which would flow and therefore allow the use of distribution chutes, and that as soon as the use of wet concrete became general, the art used the wet concrete chutes, which it could not use for the dry. In that regard, the proof was that "The more reinforced concrete came into use, the more contractors used wet concrete; and I should say that from 1908 on very much the greater portion of construction work was done in concrete than before; hence, also, the more wet concrete was used since that time." In these evolutionary stages of the concrete art, the proof is that the builders of grain elevators took a leading part in the use and distribution of wet or mush concrete. In that regard, the proof is:

"Architects in general prior to the year 1904-05 demanded that concrete be mixed what is known as very dry, and to such a consistency that it required considerable tamping to make the water flow on top; but grain elevator designers and contractors have never [fol. 627] been governed by architects' rules and guidance or specifications, as the elevator designer generally built the elevator that he designed, or that some other Company designed; therefore they were a sort of law to themselves, and, in my opinion, were the first designing engineers and contractors to use what is known in the trade as 'wet' or 'sloppy' concrete. In my opinion, this was brought about by the use of what is called 'slip' of 'movable' forms. By the use of such forms, which is usually about 4 ft. high, the wall, column, or girders, is formed by filling the movable form with sloppy concrete and reinforcing, and at the same time constantly raising the form by a series of jack screws supported on steel bars, which are embedded in the concrete. The jack screws are fastened onto these bars, and by turning down the jack screw the form is forced up; thus making the structure one monolithic mass; but to do this the concrete had to be run into the form in a liquid state, and such a liquid state that it did not require tamping, but only spading. * * *

"From the mixer the concrete was spouted into a hoist hopper. This hoist hopper was hoisted by power to the top of the building as it was in course of construction. When reaching the top a gate, which was provided on the side of this first hopper, was opened and

the concrete material allowed to discharge through a spout into another similar hopper, but stationary. This last named hopper was usually located about from 15 to 20 ft. away from the side of the hoist tower, and in the elevator work was supported on the movable form. From this hopper the concrete was drawn into wheelbarrows or concrete carts, and with these distributed into the various walls, columns and floors."

An engineering witness described the evolution and growing use of wet concrete in this way:

"About 1902, there was considerable agitation among engineers [fol. 628] of all kinds dealing with foundations, as to wet or dry concrete. The engineering fraternity was divided into two camps about that time, one advocating a concrete mixed quite dry and thoroughly tamped, and the other advocating using a concrete mixed quite wet or mixed to a consistency which would enable it to flow easily, and which did not require tamping after being placed. This agitation, to my knowledge, extended over a period of about five years, the wet fellows arguing that from a constructional standpoint the concrete was easier and more cheaply placed and made a more dense mixture. About this time, also, 1902, I joined the Western Society of Engineers and attended the meetings quite frequently, and heard papers read by different engineers on both sides of the question. The use of reinforcing steel in concrete became more customary about 1902, and a former professor of civil engineering of the University of Illinois, Prof. Pence, read a paper before the Western Society of Engineers, describing tests he had made as to the expansion coefficient of concrete, with relation to the expansion coefficient of steels.

* * * * * * *

"These experments brought out the fact that it was possible to use steel and concrete together, so far as the expansion coefficient was concerned, and following this with the increased use of reinforcing steel in concrete it was almost imperative that a wet concrete be used in order to have it properly placed around reinforcing steel. Really, according to my opinion, the introduction of reinforcing steel made it imperative that concrete more of a consistency of a liquid be used in order to build the structures then being designed, and this fact made it imperative that in handling this liquid concrete the chute or trough come into play."

Sensing the gradual increased use of the concrete art through [fol. 629] these experimental years, it would seem from the proofs that the grain elevator contractors led the way in the broader use of mobile concrete and that as the engineer determined the coefficient of relative expansion of steel and concrete was such as to permit their joint use in reinforced building construction generally, the consequent and indeed the insistent call for the use of wet or fluid concrete became more imperative, because such concrete could

be better placed around reinforcing steel and that this use of fluid concrete naturally brought with it the employment of fluid carry-

This insistent call for wet concrete was evidenced by the building requirements made by the city of San Francisco after the earthquake and fire catastrophe. In that regard an experienced engineer who went there from the East to study building conditions testified:

"There are so many different types of buildings in old San Francisco, but, roughly, the most decided change, I believe, was the general adoption of more concrete in the construction of the new buildings. As a rule concrete was substituted for former brick and tile construction wherever possible. Shortly after the earthquake two types of buildings were officially recognized by San Francisco, and generally through California, i. e., class A type, which consisted of a steel frame fireproofed by concrete; and class B building, which consisted almost entirely of reinforced concrete. This necessitated the more general use of wetter concrete than had been practiced heretofore, as walls and floors and fireproofing were of the minimum thickness allowed by safety, and could not be constructed with the older methods of dry concrete."

It is no reflection on the patent office of the United States, but simply an instance of how often the theoretical expert of an art is in his office oblivious to the atmosphere of practical accomplishment [fol. 630] in the field of achievement when we note that unconscious of this wide growing and much discussed use of wet cement the patent office, on November 2, 1909, granted Patent No. 939,072 to A. D. Ney, which was based on the specification statement by him made July 10, 1909, that "In the making of concrete, it has hitherto been the general practice in mixing the materials as stiff as possible, using only sufficient water to cause the adherence of the material together, and thereafter tamping the material to cause the mass to be as compact as possible in its relatively dry condition. In the operation of making the product of the present invention, a radically different method is followed in that an abundance of water is employed in order not only to permit gravity to bring the mass to a solid, compact condition and thereby dispense with the ramming operation, but also to provide sufficient water for the purpose of crystallization. The process of forming the present process is essentially a wet process, and distinguished from the relatively dry process employed in making concrete."

In the actual state of the working art which the proofs quoted above show in fact existed, and with the measure of the art, as evidence by the Nay patent above quoted, then held by the patent office, Callahan and a number of other alleged inventors, who thereafter were thrown into interference with each other, applied for patents which had in view the spouting or chuting of wet concrete. Without attempting to settle the questions of priority between these claimants, we may say that the period which embraces their several dates is confined to a comparatively narrow compass and to our mind they all serve to show that at or about the same time the natural mechanical evolution of the concrete art and the possibility of the use of

wet concrete mechanically, but instictively, led all these men to adopt [fol. 631] the same general types of mechanical appliances for the chuting wet concrete. It is a situation to which we feel we may reapply what was said by this Court in Elliott v. Youngstown, 181 Fed. Rep. 349: "Nor is it necessary to dwell upon the suggestion that applications were made for blue print machines with an automatic cut-off by four different inventors about the same time, Fullman and Herman among the rest. The fact that so many persons caught the idea goes rather to prove that it was simple and obvious, and not that it required inventive genius to conceive. It is not like the case where the art is waiting for the device, and inventors striving unsuccessfully to produce it, under which circumstances invention may well be held to appear."

Restricting ourselves therefore to the single one of these group inventors, we note that on January 21, 1909, Lee Callahan applied for, and on February 8, 1910, was granted, Patent No. 948,719, here in suit, for a material transferring apparatus. As stated in the specification, Callahan's alleged invention had "for its general object to provide an apparatus calculated to be used to advantage in transferring concrete or other plastic material from a suitable source of supply to points desired on a building that is being built." It also stated a second general purpose was "to provide an apparatus of the kind stated adapted more especially for use when a building is to embody reinforced concrete." And likewise a third, viz: "for transferring other material from the ground to the points desired on a building in course of construction." On his apparatus, Callahan was allowed the claims here in question, viz: 1, 2, 5 and 13, of which the first reads:

"An apparatus for the purpose described, comprising a tower, a suitably supported horizontally movable boom connected therewith, a conduit carried by the boom, means for raising plastic material [fol. 632] to a suitable point in the height of the tower, and means for receiving plastic material from said raising means and conducting the same to said conduit."

This is fairly illustrative of the elements of the other three claims. The elements of the quoted claim are first "a tower"; second, "a suitably supported horizontally movable boom connected therewith"; third, "a conduit carried by the boom"; fourth, "means for raising plastic material to a suitable point in the height of the tower," and fifth, "means for receiving plastic material from said raising means and conducting the same to said conduit."

Comparison of Callahan's apparatus with the prior art shows that it really constituted no advance over that art, but on the contrary, rather a step backward. For example, he either had no knowledge of the use of the open trough or chute, or if he had he made no mention of it or suggestion of its possible use, confining his specification and limiting his claims to "a conduit" or closed pipe. And the proof is that this closed conduit of his claims soon proved worthless on account of clogging and had to be supplanted by the

open chute of the earlier art. There was of course nothing new in his element of his elevating tower. That was as old as the elevator art. Making it extensible from story to story involved no more invention than if he had built his tower complete at the start and allowed his building to build up to tower height instead of the tower to the building height. His means to convey material up the tower was only another name for an elevator cage or container of suitable form and capacity. A receptacle for storage at the top was a common practice in grain and coal devices and a boom to carry a chute or trough was common in the grain and concrete arts. In fact, we [fol. 633] are unable to find any element of novelty either in the separate elements Callahan used or in the unification of such elements in the apparatus he suggested. Had the actual state of the prior art been shown to the patent authorities we cannot feel they would have granted this patent and while we feel embarrassed to find ourselves at variance with the Circuit Court of Appeals of the Sixth Circuit, which in the case of Concrete Appliances Co., et al. v. Meinken, et al., 262 Fed. 958, found this patent valid, we feel assured that the merger record before that court wholly failed to disclose the now uncontradicted proofs on which we base our conclusions.

In the advance in the concrete building art with the extension towers to great heights and chutes to great distances, the very magnitude and scale of the work are such as to impress the onlooker and there is danger of one's being misled by their very magnitude into the belief that they must involve invention, but when their principle is sensed it will be found the known principles and practice which marked the art long before this patent, have simply enlarged as construction enlarged its operation. That growth is in this case due to the appreciation of wet concrete and convinced as we are that in roads, piers, docks, bridges and buildings generally, concrete is the growing material of the future, we believe its advance should be in no way embarrassed by this patent by which the art is now sought to be blanketed. The Court below held the patent was not infringed; we go a step further and hold Callahan so far as the claims here involved are concerned, had no such patent claims to infringe. The cause will therefore be remanded to the Court below to modify its decree by adjudging the claims in controversy invalid and as thus modified the decree is affirmed.

[fol. 634] In United States Circuit Court of Appeals

Decree—Filed July 24, 1923

Appeal from the District Court of the United States, for the Eastern District of Pennsylvania.

This cause came on to be heard on the transcript of record from the District Court of the United States, for the Eastern District of Pennsylvania, and was argued by counsel.

On consideration whereof, it is now here ordered, adjudged and decreed by this Court, that the decree of the said District Court in this cause be, and the same is hereby modified so as to adjudge the claims in controversy invalid, but otherwise affirmed, with costs.

Victor B. Woolley, Circuit Judge.

Filed January 23, 1924

Philadelphia, July 24, 1923.

On an application with respect to costs reasonably made within the term of the decree, the above order is vacated.

Victor B. Woolley, Circuit Judge.

IN UNITED STATES CIRCUIT COURT OF APPEALS

ORDER MODIFYING DECREE—Filed January 31, 1924

Having heard and considered the application of the appellants that the costs in this cause, taxable against them, be limited to such as were actually paid by the defendant users of the alleged invention of [fol. 635] the patent; and being of opinion that the manufacturers which supplied the defendants with the alleged infringing appliances and openly defrayed in part the expenses of this litigation are to that extent privy to the action.

It is on this thirty-first day of January, 1924, ordered, adjudged and decreed that this cause be remanded to the District Court of the United States for the Eastern District of Pennsylvania, that the said court modify its decree by adjudging the claims in controversy invalid, and as thus modified the decree is affirmed, with costs to the appellees covering their proper disbursements as users and the proper disbursements of the manufacturers supplying them with the alleged infringing appliances.

Victor B. Woolley, Circuit Judge.

UNITED STATES OF AMERICA,
Eastern District of Pennsylvania,
Third Judicial Circuit, Set.:

[fol. 636] IN UNITED STATES CIRCUIT COURT OF APPEALS

CLERK'S CERTIFICATE

I, William P. Rowland, Deputy Clerk of the United States Circuit Court of Appeals, for the Third Circuit, do hereby certify the foregoing to be a true and faithful copy of the original Record in three volumes and the proceedings in this court in the case of Concrete Appliances Co. and William H. Insley, Appellants, vs. John E.

Gomery, John C. Schwartz, Michael J. O'Meara, and Concrete Construction Co., Appellees, on file, and now remaining among the records of the said Court, in my office.

In testimony whereof, I have hereunto subscribed my name and affixed the seal of the said Court at Philadelphia, this 3rd day of March in the year of our Lord one thousand nine hundred and tweny-four and of the Independence of the United States the one hundred and forty-eighth.

Wm. P. Rowland, Deputy Clerk of the U. S. Circuit Court of Appeals, Third Circuit. (Seal of United States Circuit Court of Appeals.)

[fol. 637] SUPREME COURT OF THE UNITED STATES

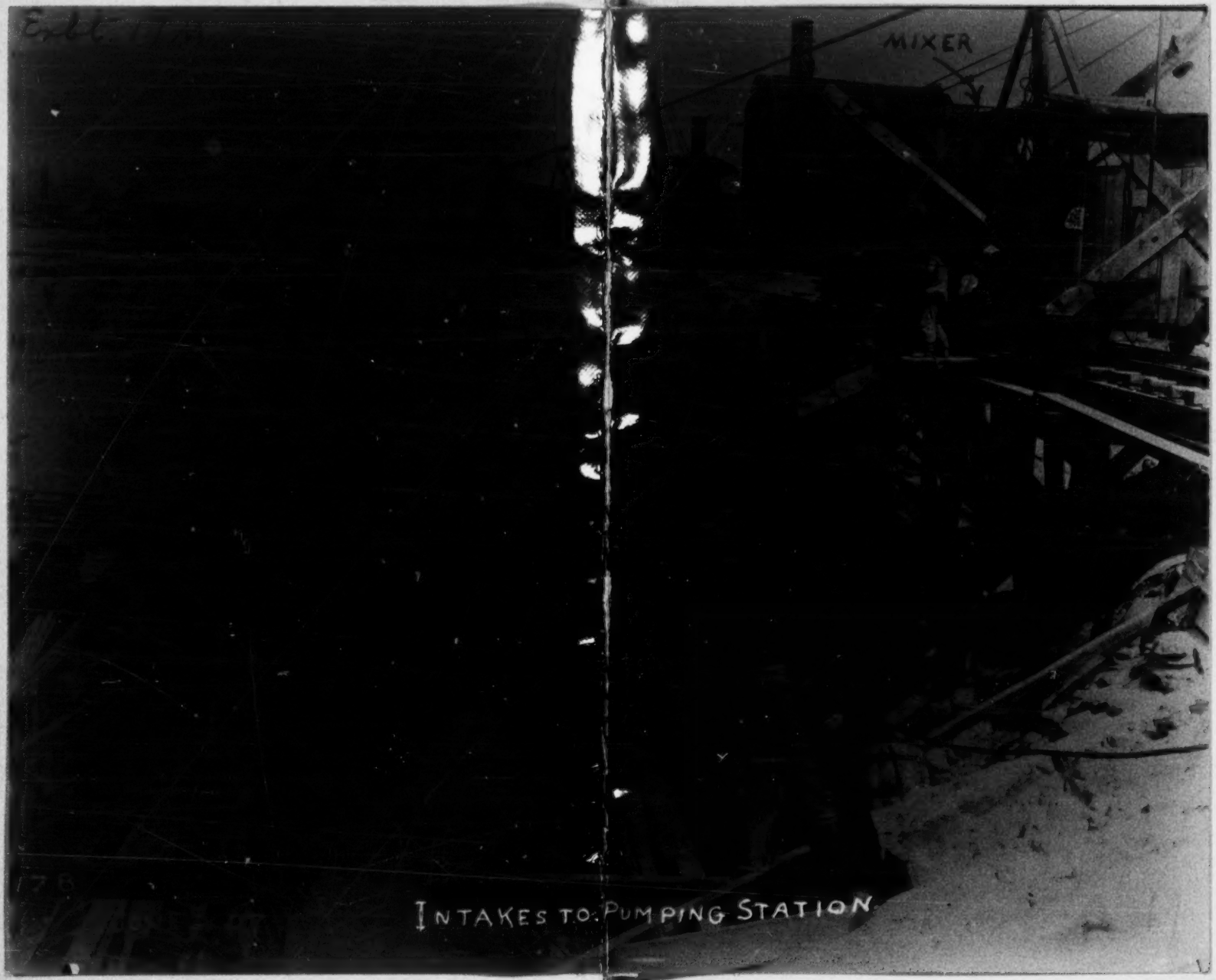
On petition for Writ of Certiorari to the United States Circuit Court of Appeals for the Third Circuit

ORDER GRANTING PETITION FOR CERTIORARI—Filed April 7, 192[illegible]

On consideration of the petition for a writ of certiorari herein to the United States Circuit Court of Appeals for the Third Circuit, and of the argument of counsel thereupon had,

It is now here ordered by this Court that the said petition be, and the same is hereby, granted, the record already on file as an exhibit to the petition to stand as a return to the writ.

END



END

SUPREME COURT OF THE UNITED STATES

OCTOBER TERM, 1924.

269
9

No. ~~307~~ 44.

CONCRETE APPLIANCES COMPANY AND WILLIAM H. INSLEY,

Petitioners,

vs.

JOHN E. GOMERY, JOHN C. SCHWARTZ, MICHAEL J. O'MEARA, AND CONCRETE CONSTRUCTION COMPANY,

Respondents.

PLAINTIFFS' EXHIBITS.

A,	Callahan Memory Sketch	72
B,	Callahan Drawing	73
C,	Photograph of Timken Bldg. Apparatus	74
D,	Callahan Nov. 29, 1908, Drawing	77
E,	Kerns Sketch	31
F,	Defendants' Structure	111
G,	Defendants' Structure	111
H,	Defendants' Structure	111
I,	Defendants' Apparatus	111
J,	Defendants' Apparatus	111
K,	Defendants' Apparatus	111
L,	Defendants' Apparatus	111
M,	Defendants' Apparatus	111
N,	Patent in Suit No. 948,719	111
O,	Kebby May 25, 1909, Photo. of Pier 38	598
P,	Kebby, April 8, 1910, Photograph	599
Q,	Kebby, February 24, 1910, Photograph	601

Joint Exhibit 6th Circuit Record 118

DEFENDANTS' EXHIBITS.

1, Photograph of St. Louis Republic, Feb. 16, 1908.. 135
2, Photograph A-B of Canadian Suit (1908)..... 135
3, Cuts of St. Louis and Des Moines Coliseums..... 136
4, Woodman Sketch of American Theater Building.. 139
5, Photograph A of Ingalls Building (1902-3)..... 145
6, Photograph B of Ingalls Building (1902-3)..... 145
7, Photograph C of Ingalls Building (1903)..... 149
8, Sketches of Mason's Temple Apparatus..... 149
9, Sketch of Utah Copper Company's Bins..... 153
10, Photograph D of Ingalls Building (1902-3)..... 154
11, Barnet & Record Blue-Prints..... 162
12, Webster Mfg. Co.'s Catalogue..... 162
13, Webb Sketch of American Theater Building..... 180
14, Photos of Tootle-Campbell Building—1908..... 183
15, Plans of Grain Elevators..... 167
16, McCann Sketch 195
17, Great Lakes Dredge & Dock Company's Photographs:
Photograph A (1907)..... 199
Photograph B (1909)..... 200
Photograph C (1910)..... 201
Photograph D (1910)..... 202
Photograph E (1911)..... 202
Photograph F (1909)..... 282
Photograph G (1908)..... 287
Photograph H (1913)..... 288
Photograph I (1910)..... 288
Photograph J (1914)..... 289
Photograph K (1906)..... 205
Photograph L (1907)..... 205
Photograph M (1907)..... 205

18, Cameron Sketch 199
19, 1912 Catalogue of Great Lakes Dredge & Dock Company 202
19′, Photograph of Lynnhaven Hotel (1906) 217
20, Smith Sketch of Lynnhaven Hotel Apparatus 218
21, Ransome Concrete Machinery Company 1906 Catalogue 220
22, Smith Photograph of St. Louis Coliseum Apparatus Aug. 27, 1908 224
23, Tatterson's Sketch 269
24, Culp's Sketch 277
25, Photograph of Page 424 of the Engineering Record of April 3, 1909 283
26, Photograph of History Cards 291
27, Blue-Print of Iroquois Iron Co. 294
28, Moulton & Co. Book 321
29, Blue-Print of Webster Manufacturing Co. 322
30, Baltimore & Ohio Coal Dock Spout 326
31, Franklin School Photograph, May 7, 1910 336
32, Black Sketch of American Theater Pipes 352
33, Blue-Print of the American Theater Building 356
34, Gerhard Sketch of 1906 Apparatus 339
36, Copies of Preliminary Statement (Smith) 369
37, Goebel Sketch 376
38, Blue-Prints of Portland, Me., Elevator 389
39, Sketch of New Orleans Spout 402
40, Photographs Pacific Coast Structures (1908-10) 408
41, Concrete Appliances Co. Apparatus 415
42, William B. Hough Co. Apparatus 415
43, Photographs of William B. Hough Co. 420
44, Photographs A, B, C and D of Majestic Theater .. 444
45, Photograph Hudson Bay Company Building, Vancouver, B. C. 102
50, Photographs A, B, C, Ashtabula Dock Photographs (1909) 461

51, Bannister Correspondence 465
52, Engineering News of August 12, 1915..... 467
53, Hughes' Sketch of 1908 High School..... 487
54, Webber Dam, (1906)..... 496
55, Webber Dam (1906)..... 496
56, Webber Dam (1906)..... 497
57, Shop Orders to Jarvis Engine and Machine Works (1906) 498
58, Certified Copy Emtman Preliminary Statement.. 505
59, Picture Majestic Theater Building (catalogue).. 519
60, Typewritten Copy Emtman Deposition of December 10th, 1914, in Vancouver Suit..... 514
61, San Francisco Barge Apparatus of 1906, Sketched May 27th, 1921.....533-545
62, Piece of Pipe..... 551
63, Certified Copies of Preliminary Statements in Two Interferences 556
64, Partial Copies and Reproductions of Miscellaneous Publications 556
65, Certificates of Clerks of Courts *re* Other Suits.. 556
66, Patents—U. S. and Foreign..... 569
67, A. L. Smith patent 948,746..... 582
68, Theodore Emtman Patent 948,723..... 582

MAR 5 1924
WM. R. STANSBURY
CLERK

IN THE

Supreme Court of the United States

OCTOBER TERM, [redacted] 1925

No. [redacted] 307

CONCRETE APPLIANCES COMPANY AND WILLIAM H. INSLEY,

Petitioners,

vs.

JOHN E. GOMERY, JOHN C. SCHWARTZ, MICHAEL J. O'MEARA, AND CONCRETE CONSTRUCTION COMPANY,

Respondents.

PETITION FOR WRIT OF CERTIORARI AND BRIEF IN IN SUPPORT OF PETITION.

ARTHUR M. HOOD,
STEPHEN J. COX,
CYRUS N. ANDERSON,
Counsel for Petitioners.

E. A. HARDIN PRINT, INDIANAPOLIS, IND.

43845

INDEX.

	Page
Petition for Writ of Certiorari	1
Brief in Support of Petition	9
Argument	12
Appendix A—Opinion Circuit Court of Appeals, Sixth Circuit	22
Opinion on Rehearing Petition	37
Appendix B—Opinion Circuit Court of Appeals, Third Circuit	40
Appendix C—Decree Circuit Court of Appeals, Third Circuit	54
Appendix D—Modified Decree Circuit Court of Appeals, Third Circuit	56
Notice of Submission	58

IN THE

Supreme Court of the United States

OCTOBER TERM, 1923.

CONCRETE APPLIANCES COMPANY AND WILLIAM H. INSLEY,
Petitioners,
vs.
JOHN E. GOMERY, JOHN C. SCHWARTZ, MICHAEL J. O'MEARA, AND CONCRETE CONSTRUCTION COMPANY,
Respondents.

No. ———.

PETITION FOR WRIT OF CERTIORARI TO THE UNITED STATES CIRCUIT COURT OF APPEALS FOR THE THIRD CIRCUIT.

To the Honorable the Supreme Court of the United States:

The petitioners respectfully represent to this Honorable Court as follows:

This is a suit brought for the infringement of the Callahan patent Number 948,719 of February 8, 1910. The Circuit Court of Appeals for the Sixth Circuit in 1920 held the patent valid as to certain claims (262 Fed. Rep. 958), and the Circuit Court of Appeals for the Third Circuit has now held the patent invalid as to the same claims, and this

petition is brought to have this court determine this conflict.

The Court of Appeals for the Sixth Circuit decided that the patent was for a new and useful and patentable invention, and the Court of Appeals for the Third Circuit has since held that there is no patentable novelty or invention disclosed therein. As a result of this conflict, a large number of users and several manufacturers in different parts of the United States are unable to determine whether the patent is valid or invalid, and can only be relieved of this dilemna by an authoritative decision of this court. In the Sixth Judicial Circuit, the patent is valid, and the owners thereof are entitled to relief against infringement, whereas in the Third Circuit the patent is invalid and the owners thereof can have no relief. In the other circuits of the United States the question is open and undetermined.

The facts are as follows:

1. This suit, alleging infringement of claims 1, 2, 5 and 13 of the Callahan patent No. 948,719 of February 8, 1910 for "Material Transferring Apparatus" (Rec., Vol. III, p. 128), was brought by the petitioners, Concrete Appliances Company and Wm. H. Insley, the patent owner and licensee, respectively, in the District Court of the United States for the Eastern District of Pennsylvania, against the respondents John E. Gomery, John C. Schwartz, Michael J. O'Meara and Concrete Construction Company, by Bill of Complaint filed July 19, 1920 (R., Vol. I, p. 10).

2. The said United States District Court, in a *final* decree entered November 20, 1922, dismissed the Bill of Complaint (R., Vol. III, p. 190), pursuant to opinions filed June 13, October 31st and November 6th, 1922 (R., Vol.

III, pp. 177 to 190, also 284 Fed. Rep. 518) in which it was held that the defendant's apparatus did not infringe.

3. The petitioners thereupon appealed to the United States Circuit Court of Appeals for the Third Circuit, which appeal came on for hearing before Buffington, Wooley and Davis, Circuit Judges, and the Court, on July 24, 1923, filed an opinion and order finding the patent invalid and affirming the decree of the said District Court as modified. Thereupon and on August 1st, 1923, the petitioners requested the Court to reconsider the questions relating to the matter of costs, and this request was granted and the issuance of the mandate withheld. The Court held the matter under consideration until January 23, 1924, when it made an order vacating the order of July 24, 1923. The Court then, on January 31, 1924, made an order modifying and affirming the decree, directing that the cause be remanded to the District Court and directing "that the said Court modify its decree by adjudging the claims in controversy invalid", and further providing that "as thus modified the decree is affirmed, with costs.". The said opinion of the Court of Appeals of July 24, 1923, orders of July 24, 1923 and January 23, 1924, and decree of January 31, 1924 are certified herewith, and are printed in the appendix to the accompanying brief and marked "B", "C" and "D" respectively.

4. Prior to the decision in this suit, the said Callahan patent has been held valid as to the same claims involved in this suit (1, 2, 5 and 13) by the Circuit Court of Appeals for the Sixth Circuit (262 Fed. Rep. 958, Warrington, Knappen & Denison, Circuit Judges), in a suit brought by these petitioners, by Bill filed August 7, 1916, against Dietrich Meinken, Roy C. Owens and George B. Curd, in the

District Court of the United States for the Southern District of Ohio, Western Division, in opinions filed January 6, 1920, and, on petition for rehearing, March 2, 1920. The said opinions of the Circuit Court of Appeals for the Sixth Circuit are printed in the appendix to the accompanying brief and marked "A". In that suit the said District Court held the said claims of the patent invalid, and this petitioner appealed to the Circuit Court of Appeals for the Sixth Circuit, which resulted in the decision sustaining the validity of the said claims of the patent. The opinion of the District Court is found at pages 43 to 46 of the record in the Circuit Court of Appeals for the Sixth Circuit which is an Exhibit in the present suit and is transmitted as such with the record of this suit.

5. The decision of the Circuit Court of Appeals of the Third Circuit does not sustain the District Court on the question of infringement, but says:

> "The Court below held the patent was not infringed; we go a step further and hold Callahan, so far as the claims here involved are concerned, had no such patent claims to infringe." (Opinion last par.)

It is thought that the lower Court placed an extremely narrow construction upon the claims of the patent in suit, and then held the said claims not infringed, in order that the plaintiff might be required to assume the burden of the appeal and because he considered the patent invalid but did not wish to take issue with the Court of Appeals for the Sixth Circuit. That he regarded the patent as invalid unless "limited to the specific special construction which the patentee devised" is expressly stated in his opinion. (Rec., Vol. III, p. 182). If, therefore, the decision of the

Circuit Court of Appeals for the Sixth Circuit holding the patent valid is correct, the patent must be construed with reasonable breadth, and as thus construed must be infringed.

6. That the decisions of the Sixth and Third Circuit Courts of Appeals are in conflict is shown by the language of the two opinions. Thus the Circuit Court of Appeals for the Sixth Circuit, referring to the same claims which were before the Circuit Court of Appeals for the Third Circuit, said (262, Fed. Rep. 958, 965):

> "On the other hand, we recall no instance of combinations of old elements which has been held to produce 'a new result' in a patentable sense and which better deserves that commendation than does Callahan's. *The quasi automatic elevation and distribution of wet concrete under the varying conditions of progressive building and by a single apparatus was an entire novelty.* No one had tried to do it; apparently, no one had thought of it; it was useful in a very high degree; and when we find a new result in this complete and extreme sense accomplished by a confessedly new combination—though of known means—we think both the purpose of the patent law and the rightful application of the decisions thereunder require that it should be awarded the merit of invention." (All italics ours.)

The Circuit Court of Appeals for the Third Circuit, referring to the same claims, and to the same combination of old elements, said (opinion next to last par.):

> "In fact, we are unable to find any element of novelty either in the separate elements Callahan used or in the unification of such elements in the apparatus he suggested."

The conflict therefore arises from the holding of the Sixth Circuit Court of Appeals that Callahan's apparatus was not for a mere aggregation of old parts but for a patentable combination, and the holding of the Circuit Court of Appeals for the Third Circuit that there was nothing patentable in that combination.

7. The records before the two Court of Appeals in the Sixth and Third Circuits are substantially the same, so far as they relate to the question of aggregation or invention. The record in the Sixth Circuit Court of Appeals contains fifteen prior United States and British patents, granted at various times between the years 1864 and 1907, and the record in the present suit contains thirty-seven United States and British Letters Patent granted during the same period, including thirteen of the fifteen patents found in the first record. These patents are believed to be merely cumulative, and to add no new element of importance to the elements shown by the patents of the earlier record, which were fully considered by the Court of Appeals for the Sixth Circuit when it rendered its decision sustaining the validity of the patent. The present record contains much evidence relating to prior uses which was not before the Court in the Sixth Circuit, but these prior uses are substantially uses of the apparatus shown in the prior patents which were considered by that Court, and were not uses of the *complete* apparatus of the claims, nor of parts having the same peculiar structural features of some of the parts specified in the combinations of such claims. The conflict is therefore one of decisions based upon substantially the same facts, or at least facts which have substantially the same relation to the questions decided. A reading of the last paragraph but one of the opinion of the Circuit Court

of Appeals for the Third Circuit, and a comparison of the summary of parts found in the prior art with claim 5 of the patent will show that two elements at least were lacking, viz: the "boom carrying the conduit" or so-called "boom spout", and the vertical adjustability of the bin or "means for receiving plastic material." These two elements being absent, the combination cannot be present in the prior art.

8. The subject matter of the patent in suit is what is commonly known as a gravity concrete distributing plant, and such plants are very extensively used in the construction of buildings throughout the United States. It comprises a tower in which the concrete is elevated to the proper height, as the building rises, a vertically adjustable receptacle on the tower, which also rises with the building, and conduits or "spouting" provided with truss work which gives it the appearance of a boom, and enables the builder to distribute concrete to all parts of the building laterally and vertically, without rebuilding or rearranging the distributing plant. These plants are a familiar sight in every section of the country. It is therefore of the utmost importance not only to the parties to this suit but to the building industry and the public at large that an authoritative ruling of this Court on the question of the validity of the Callahan patent shall be made, and the doubt and uncertainty which now exists in seven of the nine Judicial Circuits of the United States concerning its validity shall be removed.

9. The petitioners believe and respectfully represent that the decision of the Circuit Court of Appeals for the Sixth Circuit holding the Callahan patent to be valid was right, just and correct in law, and that the contrary deci-

sion of the Circuit Court of Appeals for the Third Circuit in this case was erroneous.

WHEREFORE the petitioners respectfully pray:

That a writ of certiorari may issue out and under the seal of this Honorable Court, directed to the United States Circuit Court of Appeals for the Third Circuit, commanding said Court to certify and send to this Court a full and complete transcript of the record of all of the proceedings in this cause, to the end that said cause may be reviewed and determined by this Court, as provided by law; and that the petitioners may have such other and further relief as to this Court may seem appropriate and in conformity with law.

ARTHUR M. HOOD,

STEPHEN J. COX,

CYRUS N. ANDERSON,
Counsel for Petitioners.

We hereby certify that we are of counsel for petitioners herein, Concrete Appliance Company and William H. Insley; that in accordance with the request of said petitioners the foregoing petition has been prepared; and that the allegations contained in said petition are true, to the best of our knowledge and belief; and that said petition is, in our opinion, well founded in law and in fact, and should be granted.

ARTHUR M. HOOD,

STEPHEN J. COX,

CYRUS N. ANDERSON,
Counsel for Petitioners.

IN THE

Supreme Court of the United States

OCTOBER TERM, 1923.

CONCRETE APPLIANCES COMPANY AND WILLIAM H. INSLEY,
Petitioners,
vs.
JOHN E. GOMERY, JOHN C. SCHWARTZ, MICHAEL J. O'MEARA and CONCRETE CONSTRUCTION COMPANY,
Respondents.

No.

BRIEF IN SUPPORT OF PETITION.

The grounds upon which the writ of certiorari is asked are briefly as follows:

1. The decision of the Court of Appeals for the Third Circuit, here sought to be reviewed, is in conflict with the previous decision of the Circuit Court of Appeals of the Sixth Circuit, in the case of *Concrete Appliances Company and William H. Insley* (the petitioners), *v. Dietrich Meinken, Roy C. Owens,* and *George B. Curd,* in which it was held the Callahan patent here in suit valid. (262 Fed. Rep. 958.)

The issues upon which the case was decided on full hearing, in the Sixth Circuit in favor of the patent, were in the present suit decided in the Third Circuit adversely to the patent. In each case, there was such a presentation of the state of the art that the conflict of decisions cannot be attributed to a substantially different state of facts, but is clearly attributable to a different interpretation of the law applicable to the facts and a different interpretation of the facts and their import. *The two courts have therefore directly disagreed on substantial issues.*

The result is that the patent is valid in the Sixth Circuit and invalid in the Third Circuit. This situation should be corrected, and more particularly since the case is of great importance, and effects directly or indirectly manufacturers of gravity concrete distributing apparatus, or "spouting plants" throughout the United States and the entire building industry, and the conflict of decisions has caused a condition of confusion in the various circuits.

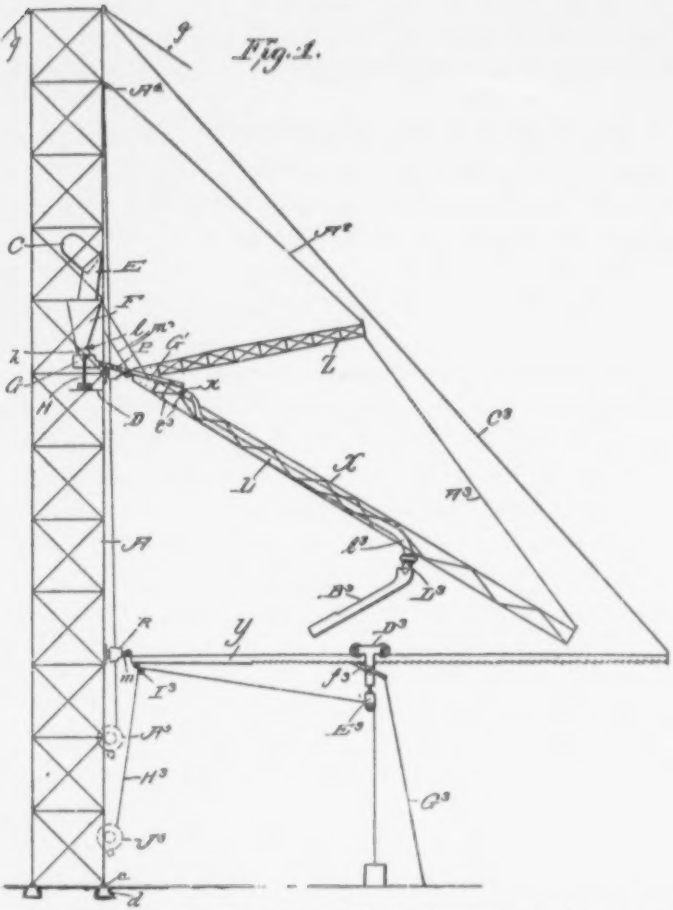
2. The Circuit Court of Appeals for the Sixth Circuit held that even though the improvements defined by the claims of the patent in suit be regarded as a combination of old elements it was patentable invention to bring these elements together in such a way as to form the plant covered thereby, whereas the Circuit Court of Appeals for the Third Circuit has declared that there was nothing new or patentable in this combination. In both Courts the particular entire combination of elements was not found in the prior act. This is apparent from a reading of the opinions. It is further apparent from the records that certain of these elements were not found in the particular form in which they appear in the patent. The Court in the Third

Circuit however, held that this combination was but a natural assemblage of parts, made to meet the conditions and serve the purposes which the patentee had in mind, whereas the Sixth Circuit Court of Appeals held that invention was required to bring these parts together into a unitary structure or plant. It is contended that the decision of the Sixth Circuit Court was correct and that the decision of the Third Circuit Court was erroneous.

ARGUMENT.

The Callahan patent in suit is for *a contractor's plant*, commonly known as a spouting plant, adapted to be used for the purpose of distributing concrete by gravity to all points laterally and vertically of a building under construction from a central concrete mixing point. The object is to enable the builder to bring all his concrete making materials to one point on the job, mix them there and then, by means of this gravity distributing plant to elevate them and chute them to any and all points throughout the entire growing structure, and without re-constructing or re-arranging the various parts of the plant, so that once the concrete distributing plant is set up it will remain substantially intact and supply all parts of the building. When the building is completed the concrete distributing plant is taken down and removed and may be set up and used in the same manner on another job, and so on. The construction and arrangement is such that the plant may be used on any and all ordinary buildings, and under any and all conditions, without alteration. In other words, the plant covered by the patent is in effect a contractor's tool or implement, universally usable on all usual building constructions. It may also be used without alteration in the construction of walls, bridges, viaducts and other works.

The following cut, which is a reproduction of Fig. 1 of the patent (R., V. III, p. 128), shows diagrammatically an embodiment of the improvements:



In this illustration A is a skeleton tower, which may be erected to the height of the building in the first instance or extended upward as the building rises by simply adding the interchangeable duplicate sections at the top of those originally placed.

C represents a common form of hoisting bucket, arranged to be raised to any desired point in the tower to

automatically dump the concrete—which is mixed at the base of the tower—into a hopper or receptacle represented at F.

G is a pan, bin or "receptacle" which receives and holds the mixed concrete, and from which the concrete is fed as desired, by means of a suitable gate, to the conduit chute or spout extending to all parts of the building.

The hopper F and pan G constitute the "receptacle" for the material, and are mounted in the tower in such a manner that they may be moved upwardly therein as the building rises so that they will always be elevated above the level of the concrete work and give the concrete a proper head so that it will flow by gravity to the points of application.

L is the conduit chute or spout through which the concrete flows from the adjustable receptacle in the tower to any and all parts of the building. In the illustration it consists of a pipe or conduit carried by a long arm or "boom" consisting of bars or rods and truss work. The conduit proper is inside this boom and connected therewith so that the two form in effect a unitary structure. The boom or arm is represented at X.

The combined boom and conduit or "boom spout" is vertically adjustable on the tower, so that, like the receptacle it can be raised higher and higher as the building grows. It is also mounted so that it can be swung sidewise through the greater part of a circle, and also so that it can be swung up or down.

The chute or conduit L has a swiveled end section B3 jointed thereto, and there may be as many of the sections L as the lateral dimensions of the building require. The boom chutes are commonly made 48 feet in length, and it will be seen that not more than two or three of them will

be needed to provide a radius sufficient to cover any ordinary building area.

The claim of the patent taken by the Court of Appeals for the Sixth Circuit as a typical definition of the improvements is claim 5, which reads:

> "5. An apparatus for the purpose described, comprising a tower, a conduit, extending laterally therefrom, a suitably-supported, horizontally-movable *boom carrying the conduit;* said boom being *adjustably* connected with the tower and adapted to be arranged *at various points in the height thereof,* means for raising plastic material to the point desired in the height of the conduit, and means for receiving plastic material from the raising means and conducting same to the conduit; the said receiving and conducting means being *adjustable in the direction of the height of the tower.*"

It will be seen that this claim is for an apparatus consisting of a combination of the following parts or elements.

1. A tower,
2. a conduit extending laterally therefrom,
3. a suitably supported horizontally-movable boom *carrying the conduit;* said boom being *adjustably connected* with the tower and adapted to be arranged *at various points in the height thereof,*
4. means for raising plastic material to the point desired in the height of the conduit (tower),
5. means for receiving plastic material from the raising means and conducting it to the conduit; said receiving and conducting means being *adjustable in the direction of the height of the tower.*

In other words, it calls for an apparatus consisting of (1) a tower, (2) a conduit, (3) a swinging and vertically

adjustable boom carrying the conduit, (4) a hoisting bucket or the like, and (5) a vertically movable bin or receptacle communicating with the conduit.

The details of the illustrative embodiment of the improvement claimed are fully described and shown in the specifications of the patent, and need not be here described at length. The patent is not limited to such details of construction (Pat. p. 3, ll 69 to 77).

Concerning this apparatus the Court of Appeals for the Sixth Circuit said (262 Fed. Rep. 961):

> "It occurred to Callahan that he could construct a tower, or skeleton elevator shaft, which should originally extend, or which, by successive additions, should be made to extend well above the highest story of the proposed building; that he could attach to this tower, and make *vertically adjustable thereon* a receiving bin or hopper carrying a downwardly inclined and revolubly connected discharge chute, which could be swung about to reach various points on the next lower level to that where the receiving bin was fixed; that this receiving bin and its discharging apparatus could be temporarily fixed, as the building advanced, at positions on the tower suitably elevated *above each successive story;* that the mush concrete could be elevated inside the tower to these various fixed positions and there dumped into the receiving bin; and that, in this way the mush concrete could be delivered *in an approximately automatic way throughout the successive floors or levels of a building, no matter how high.* Upon this record, this general thought was wholly novel. It has proved to be of great commercial value."

The Court of Appeals for the Sixth Circuit further said (Id. p. 964):

> "Callahan's conception, that this material could be thus treated so as to deliver it from the ground

all about the successive several floors of a high building and with practically no manual labor, except that involved in the story by story adjustment of the apparatus, involved, we think, inventive thought of a high order, when accompanied as it was by the devising of suitable apparatus to carry out the thought, which apparatus substantially differed from anything which had ever been constructed for any purpose, although every element was old."

And again, in stating that the apparatus answered the test of the decisions of this Court, and the lower courts, and possessed the requisites of a patentable combination (Id. pp. 965-966):

> "On the other hand, we recall no instance of combinations of old elements which has been held to produce 'a new result' in a patentable sense and which better deserves that commendation than does Callahan's. The *quasi automatic* elevation and distribution of wet concrete under the varying conditions of *progressive* building and *by a single apparatus* was an entire novelty. No one had tried to do it; apparently, no one had thought of it; it was useful in a very high degree; and when we find a new result in this complete and extreme sense accomplished by a confessedly new combination though of known means—we think both the purpose of the patent law and the rightful application of the decisions thereunder require that it should be awarded the merit of invention.
>
> We have stated our conclusion that the device of the patent is not an aggregation, in the sense that it represents such a mere assembling of old elements as might have been made by the exercise of only ordinary skill. It is at least equally clear that the device is not an aggregation in the more technical sense of the word, but is rather a true combination. It is true that the use of the apparatus involves successive steps, and is at each of its stages under di-

> rect or indirect manual control; but in a fair sense the entire operation of elevating and distributing the concrete is a *unitary thing. From the time it starts on its journey from the ground to the time it is deposited in the forms, its progress might well be automatic.* There is clear distinction between this performance and that of the associated washing and wringing machines, discussed by the Supreme Court in *Grinnell Co. v. Johnson Co.*, 247 U. S. 426, 38 Sup. Ct. 547, 62 L. Ed. 1196."

A pertinent statement in the specification of the patent (p. 3, ll. 60 *et seq.*) is the following:

> "It will also be manifest that as a building is raised the booms and the appurtenances can be raised, and when the apparatus is in use the only manual labor necessary to the successful operation thereof is one man on the platform D, one man to manipulate the lines of the booms, and three men to supply and set materials and tamp walls, etc."

That the combination of parts in the manner specified produced a new article—a universally usable and adjustable gravity concrete distributing plant—and a new result seems indisputable. But the Court of Appeals for the Third Circuit held that this did not involve invention, but was the result of mere bringing together of old parts by the exercise of ordinary skill.

The Court of Appeals for the Third Circuit, however, *did not base its decision on claim 5 of the patent,* which the Court of Appeals for the Sixth Circuit regarded as the best definition of the invention. The decision in the Third Circuit appears to have considered only claim 1, which is the claim quoted in the opinion, and which is *for an incom-*

plete sub-combination. The Court of Appeals for the Third Circuit in this opinion, said:

> "On his apparatus, Callahan was allowed the claims here in question, viz: 1, 2, 5 and 13, of which the first reads:
>
> 'An apparatus for the purpose described, comprising a tower, a suitably supported horizontally movable boom connected therewith, a conduit carried by the boom, means for raising plastic material to a suitable point in the height of the tower, and means for receiving plastic material from said raising means and conducting the same to said conduit.'
>
> This is fairly illustrative of the elements of the other three claims. The elements of the quoted claim are first 'a tower'; second, 'a suitably supported horizontally movable boom connected therewith'; third, 'a conduit carried by the boom'; fourth, 'means for raising plastic material to a suitable point in the height of the tower', and fifth, 'means for receiving plastic material from said raising means and conducting the same to said conduit.' "

The elements of this claim are then compared with the prior art—but without considering the conduit *"carried by the boom"*—and the conclusion reached that the elements of this *incomplete* combination were found in the prior art.

It will be seen therefore that the Court in the Third Circuit, in comparing the apparatus of the patent with the prior art did not consider two of the most vital and important features of the apparatus, viz: (a) the *combination boom conduit*, which made the suspended extension of the gravity feeding devices to cover all building areas possible, and (b) and the *vertical adjustability* of the receptacle and the boom which enabled the plant *to rise with the building* to any desired height.

The first element is expressed in claim 1 but does not appear to have been taken into consideration, and the second element is not expressed in claim 1 at all, and also appears to have been overlooked by the Court in comparing claim 1 with claim 5.

The court says, speaking of the tower:

> "There was of course nothing new in his element of his elevating tower. That was as old as the elevator art. Making it extensible from story to story involved no more invention than if he had built his tower complete at the start and allowed his building to build up to tower height instead of the tower to the building height."

But it is not the extensibility of the tower that is of such importance (the claims do not specify an extensible tower), but the vertical adjustability of the bin or receptacle and the boom conduit in the tower.

The court further says of the receptacle:

> "A receptacle for storage at the top was a common practice in grain and coal devices and a boom to carry a chute or trough was common in the grain and concrete arts."

This is very true, but it does not touch upon the vital points which are that the conduit *is actually carried by the boom,* forming a new device known as a boom conduit or chute, and that the receptacle for storage is not at the top of the tower but is *adjustable throughout the height of the tower* to serve all levels of the building from the ground to the roof.

The evidence relating to prior uses of one or more elements of the combination need not be considered, since all

of these elements are old in a general sense, and were treated as old by the Court of Appeals for the Sixth Circuit, and concededly the complete combination *which is essential to the realization of the patented improvement* is not found in any prior use device. Furthermore, the prior uses referred to in the decision of the Court of Appeals for the Third Circuit were of apparatus *substantially the same as that of the prior patents found in the record in the Sixth Circuit;* and since this apparatus lacks essential features of the patented combination no evidence that it was actually used can make it an anticipation of that combination.

CONCLUSION.

It is therefore respectfully submitted that the foregoing petition for a writ of certiorari should be granted.

ARTHUR M. HOOD,

STEPHEN J. COX,

CYRUS N. ANDERSON,
Counsel for Petitioners.

APPENDIX A.

No. 3241.

IN THE

UNITED STATES CIRCUIT COURT OF APPEALS
FOR THE SIXTH CIRCUIT.

CONCRETE APPLIANCES COMPANY, ET AL.,
Plaintiffs and Appellants,
vs.
DIETRICH MEINKEN, ET AL.,
Defendants and Appellees.

Appeal from the Southern District of Ohio, Western Division.

SUBMITTED MARCH 5, 1919.
DECIDED JANUARY 6, 1920.

Before WARRINGTON, KNAPPEN and DENISON, Circuit Judges.

Suit upon patents numbered 948,719, issued July 8, 1910, to L. Callahan, and 948,746, issued February 8, 1910, to A. L. Smith.

This case involves the tower apparatus now in common use for elevating and distributing wet ("mush") concrete upon the successive floors of high buildings, constructed in whole or in part from that material. The apparatus, as now used, involves two steps: first, elevating the material to a reservoir or hopper bin temporarily fixed at the de-

sired elevation in the tower; and, second, distributing it from that elevation, by gravity, through a conduit revolving at the point of connection with the hopper bin and having at least one swivelled elbow joint, whereby any desired point upon the selected horizontal plane can be reached for the gravity discharge of the material. Callahan and Smith each showed, in his drawing, the complete apparatus, but Callahan made no claim to the feature of the double swivelled discharge pipe. Callahan's application was filed January 21, 1909; Smith's on February 23rd of the same year. The Patent Office notified Callahan that his application seemed to conflict with another, and suggested to him some of the claims which Smith had made. Callahan adopted these claims, whereby an interference was declared. The substance of the issue is shown by count one, which is given in the margin.(1) Upon this issue, Callahan conceded priority; judgment was rendered upon the concession; Callahan canceled these additional claims; and both patents issued. Both patents, by assignments, licenses, etc., became the property of the Concrete Appliances Company and Insley, and this suit was brought by them in the court below based upon alleged infringement of both patents. The above quoted count 1 of the interference became claim one of the Smith patent, and is typical of those sued upon. Claim 5 of the Callahan patent is here quoted(2), and may

(1) "In a device for distributing concrete, means for elevating the concrete to a point above the work to be performed; a hopper adapted to receive the concrete so elevated; a primary distributing pipe revolubly mounted beneath the hopper; and a secondary distributing pipe revolubly mounted beneath the mouth of the first named pipe, substantially as described."

(2) "Claim 5. An apparatus for the purpose described comprising a tower, a conduit extending laterally therefrom, a suitably supported horizontally movable boom carrying the conduit, said boom being adjustably connected with the tower and adapted to be arranged at various points in the height thereof, means for raising plastic material to the point desired in the height of the conduit [tower] and means for receiving plastic material from the raising means and conducting the same to the conduit; the said receiving and conducting means being adjustable in the direction of the height of the tower."

be accepted as a statement of his invention said to be infringed. Claims 1, 2 and 13 are also declared upon.

DENISON, Circuit Judge:

It goes without saying that the Smith patent can get no advantage merely because it has been owned and commercially exploited along with the Callahan patent. Upon this record, Smith cannot claim to be the inventor of anything shown by Callahan's application,—except as the latter is modified by the later concession of priority. The Callahan patent is not a part of the prior art, in the sense in which that phrase is used with reference only to publications, but the Smith patent, both as to anticipation and as to the presence of invention, must be judged upon the basis of which the earlier Callahan application is a part (*Lemley v. Dobson-Evans Co.*, 243 Fed. 391). It must, therefore, be assumed, as against Smith, that the advance of his claim 1 consisted merely in taking the concrete elevating and distributing apparatus of Callahan and substituting for Callahan's simple discharging conduit, revolving only at the point of attachment to the receiving hopper, the compound discharging conduit consisting of two or more sections revolubly connected with each other(3). We are not convinced that this advance involved any invention. Such a double swivelled conduit was a well known expedient for the gravity conveying of any material which it was desired to discharge at selected points in a lower horizontal plane. It is obvious,—at least when it is pointed out to us,—that with an inclined conduit swinging at its upper end, the lower end could be made to reach any desired point on the lower plane, either by changing the angle of inclination and

(3) We speak thus of Callahan's form, because of the necessary effect of the filing dates, the concession and the form of the issued claims.

modifying the length of the conduit, as by telescoping a section, or by adding a supplementary conduit revolubly connected with the lower end of the primary one. Neither form had been in use for concrete (before Callahan), but both forms were old for other purposes. The double swivelled form had been most highly developed in grain elevators for distributing the grain from the elevated receiving bin to the several openings on the floor below, which indicated spouts leading to still lower storage bins.

If the matter were to be considered in the broadest sense, there might be such distinctions between elevating and distributing grain and elevating and distributing concrete that transferring a device from one art to the other and making the necessary adaptation would involve invention; that need not be decided; but here, *Smith begins at the point where the elevation of the concrete is finished;* he has then merely the question of gravity distribution. He finds that concrete has been distributed and grain has been distributed by a single unitary chute, swinging and turning at its upper end, and that grain has also been distributed by the double swivelled chute, thereby increasing the ability to select exactly the desired point for discharge. In the words which were used in *Crown Co. v. Sterling Co.*, 217 Fed. 381, Callahan had already "bridged over whatever gap there was" between the art of concrete building and the art of gravity distribution, and the "door of opportunity was open" to all who wished to use in the former art an expedient well known in the latter. It seems to us quite clear that there is no invention in adding to the device of Callahan the well-known additional swivelled joint in the discharge conduit. It follows that those claims of the Smith patent sued upon are invalid, and the decree of the

court below, which dismissed the bill as to this patent, must so far be affirmed.

At the time these patentees appeared on the field concrete had already come into extensive use as a building material in connection with metallic re-enforcements, and it had been found that it was suitable for buildings of all shapes and of many stories in height. When mixed of the proper consistency, it was called mush concrete, and to handle this material and deliver it efficiently at the place of use in a large building operation was a considerable problem. Various methods had been employed, but the one most approved consisted in raising it by elevator to the floor or level where it was to be used and there dumping it into wheelbarrows, by which it was conveyed to the various desired points of use upon that level. It occurred to Callahan that he could construct a tower or skeleton elevator shaft which should originally extend, or which, by successive additions, should be made to extend, well above the highest story of the proposed building; that he could attach to this tower, and make vertically adjustable thereon, a receiving bin or hopper carrying a downwardly inclined and revolubly connected discharge chute, which could be swung about to reach various points on the next lower level to that where the receiving bin was fixed; that this *receiving bin and its discharging apparatus* could be *temporarily fixed*, as the building advanced, at positions on the tower suitably elevated above each successive story; that the mush concrete could be elevated inside the tower to these various fixed positions and there dumped into the receiving bin; and that, in this way, the mush concrete could be delivered in an approximately automatic way throughout the successive floors or levels of a building, no matter

how high. Upon this record, this *general thought* was wholly novel. It has proved to be of great commercial value. It is common knowledge that, largely within the period since the patent issued, re-enforced concrete has largely superseded all other materials in the erection of large structures, and the record shows that eighty or ninety per cent of all the important construction work of this class in the country employs this Callahan method, and that all of the larger manufacturers of machinery and apparatus for this general purpose have taken licenses under the patent. It is not too much to say that the invention has played a large part in revolutionizing the building industry, and that it is not common for a patent in litigation to find itself supported by such a large measure of commercial merit and public acquiescence.

It is not contended that the patent is anticipated, in the strict sense of that term, but the defendant's position, approved by the court below, is that Callahan only put together old and familiar elements, and that his advance did not involve invention over what had gone before. To determine this question, we must know, first, the character of the relations between what was old and this new arrangement, and, second, whether his claims are properly characterized by reference to his real advance. To elevate material to a fixed and invariable height and to distribute it therefrom, by gravity, through a swinging, revolving chute, to different discharge spots upon a lower level, was common. As we have said, in considering the Smith patent, this was familiar in the class of grain elevators. The typical so-called grain elevator, or storage house, was a permanent structure, and grain was carried by various types of elevating apparatus to the permanent top floor or level.

From the bottom of the bin there situated, depended a swinging chute which could be moved about so as to discharge, upon the floor below, into any storage bin opening from that level. These grain elevators, like others of similar type shown by the record, entirely lack the only substantial novelty claimed for Callahan. *They did not have a temporary receiving bin or hopper with a connected discharge chute vertically adjustable in an elevator tower,* adapted to distribute the material upon successive levels. If invention lies in this thought and its practical application, the grain elevators are not important.

Next, we are cited to several examples of unloading apparatus for vessels, of which the English patent to Baillie, No. 10,380, of 1888, is as relevant as any. In this device, which was for transferring coal from a barge to the ship alongside, there was a receiving bin or hopper located in an elevated frame-work or staging on the barge, and from which a depending chute carried the material away by gravity to the proper bunker in the ship. The coal contents of the barge were raised to this point by an endless chain of buckets over an inclined mast or support pivoted to the vertical frame at its upper end. Evidently, as the contents of the hold of the vessel became lowered, this mast must be extended further down, or further to one side, and this could be done either by an extension of the lower end or by lowering the upper pivoted point. The patent shows both methods of adjustment. The bin and pivot could be lowered upon this supporting stage a short distance,—not more than the height of the bin. The point of final delivery was not changed. Such vertical adjustability as there was in the bin was incidental to raising and lowering the whole "tower" to accommodate it to the point where elevation be-

gan. We do not find here any substantial disclosure of the real novelty of Callahan's invention, as above stated.

This leaves for consideration only the patent to Theiss, et al, No. 866,166, of September 17, 1907. It is not to be doubted that this is suggestive of the idea and the apparatus of Callahan; whether it is more than a mere suggestion is the question. Theiss' apparatus, like Baillie's, was intended for unloading coal from a barge and loading it into the hold of a ship. It consisted essentially of a tower-shaped structure permanently erected upon the deck of a barge or scow. It was intended to reach a distance substantially higher than the coal receiving hatchways of the particular ship which might be selected to be served; there was never occasion to make it any higher. This tower carried an elevator car or skip which was loaded with coal when it was at the bottom of the tower, and then was elevated as far as necessary to be dumped into a receiving bin, which bin was capable of vertical adjustment on the tower. This receiving bin in turn dumped into a chute which, at its lower end, discharged through the hatchway of the vessel to be loaded. This chute was not revolubly connected with the bin or tower. It could not be moved laterally. It was carried, by the tower, in ways or guides which gave the chute its inclination and permitted it to slide therein longitudinally. There was a permitted adjustment of the guide by which the angle of inclination could be changed, but this was done by releasing and readjusting and refastening the guide-ways, and could not be done as a part of the operation of the device while in use. The adjustment and fixing of the chute, in order to discharge into a desired hatchway, was a complicated matter. First, the carrying scow must be so positioned and fastened with reference to the ship

that the tower was exactly opposite the hatchway. Second, the receiving bin and the chute must be adjusted vertically in the tower at such a position that the chute, in its carrying guides, would be pointed at the hatchway. Third, the chute must be slid downward and outward in the direction at which it was pointed until its lower end entered the hatchway. If, then, it was next desired to reach another hatchway on the same transverse line, the vertical adjustment of the bin and the chute carrier, and the aiming of the chute at the new hatchway and its longitudinal extension into contact therewith, must be repeated. If it were desired to reach hatchways further forward or aft, the scow and its entire apparatus must be released and floated along side the ship to its new position. In the broadest sense, this patent shows a plan of elevating material to an adjustable vertical height and from there distributing it by gravity to selected positions upon a lower level; but it shows this idea in a very rudimentary form; it would be practically useless, for the purposes now involved.

In details of construction and of claim reading, there is ample differentiation. Claim 5 of Callahan, above quoted, will not read on Theiss. A comparison of the Theiss apparatus with this claim shows: (a) That the Theiss apparatus is not "for the purpose described", in any restricted sense of that phrase. (b) That Theiss has a relatively short supporting framework, rather than a relatively high and distinctive tower. (c) That while Theiss has "a conduit", it does not "extend laterally therefrom", excepting in the most general sense. (d) That Theiss has no "suitably supported horizontally movable boom carrying the conduit", nor anything which approximates such a boom. (e) That since he has no boom at all, of course, he has no boom

"adjustably connected with the tower and adapted to be arranged at the various points of the height thereof"—but it must be said that Theiss' conduit itself has this vertically adjustable connection with the tower. (f) The remaining elements of the claim are literally met well enough by Theiss, save for the distinction as to their use with plastic material.

The question presented by Theiss seems not to be one merely of double use, because the structural differences are too great; but if the physical resemblance were much closer, the defense of double use would be far from satisfactory. (See *Ansonia Co. v. Electrical Co.*, 144 U. S. 11, 18; *Potts v. Creager*, 155 U. S. 597, 606-8; *Hobbs v. Beach*, 180 U. S., 383, 390; *Gold v. Newton*—C. C. A. 2—254 Fed., 824, 827.) *Certainly, the art of loading coal into a ship for fuel is not the same art as that of distributing wet concrete to a building structure; nor is the analogy very close.* It is not at all certain, even if probable, that an experienced building engineer, considering methods of handling wet concrete for a skyscraper, would call to mind a coal-handling apparatus on a harbor scow. *On the other hand, it impresses us as a bold and original thought that this material could be handled in this way.* Distributing mush concrete through gravity chutes by one apparatus throughout the whole course of building obviously involved difficulties; it had never been handled by gravity chutes at all excepting under simple conditions where these difficulties did not exist,—and then, perhaps, had been done only on paper; on one side was the danger that it would adhere to the chutes and set and choke up the pipes at least at the valves and gates; on the other side, the risk that the elements would disintegrate and the water and the cement and the broken stone fall in separate

strata. *Callahan's conception, that this material could be thus treated so as to deliver it from the ground all about the successive several floors, of a high building and with practically no manual labor, except that involved in the story by story adjustment of the apparatus, involved, we think, inventive thought of a high order, when accompanied as it was by the devising of suitable apparatus to carry out the thought, which apparatus substantially differed from anything which had ever been constructed for any purpose,—although every element was old.* It is true, in a sense, that the Callahan device is produced upon the basis of Thiess' structure by substituting for the longitudinally sliding and extensible delivery chute of Theiss, the revolubly mounted chute of the grain elevators; but this is not the whole truth. Callahan built up his tower to a height never thought of by Theiss, and which Theiss could not have accomplished without capsizing his barge; and Callahan supplied a chute-supporting boom attached to the receiving hopper and vertically adjustable with it, a feature which the grain elevators did not have and could not have used. He thereby laid the basis for adapting the structure to a use fairly distinct from that of either a coal elevator or a grain elevator.

As upon every such question, there is no authoritative decision which compels one or the other conclusion; the doubtful inference is rather one of fact; but we select and refer to a few instances where invention has been found,—by the Supreme Court or by this court,—and the facts of which may well be thought to present no stronger inferences in its favor than do those of the instant case (*Loom Co. v. Higgins*, 105 U. S., 581, 590; *Hobbs v. Beach*, 180 U. S., 383, 393; *Expanded Co. v. Bradford*, 214 U. S., 366, 381; *National Co. v. Aiken*, 163 Fed., 254, 259; *Warren v.*

Owosso, 166 Fed., 309; *Morgan Co. v. Alliance Co.*, 176 Fed., 100, 109. *Ferro-Concrete Co. v. Concrete Co.*, 206 Fed. 666; *International Co. v. Sievert*, 213 Fed., 255).

The test of the presence of invention in a new assembly of old elements is sometimes said to be whether a new result is accomplished. This is often not a helpful rule, because its application involves definition of the phrase "new result"; and this opens the original difficulty. Within a narrow definition, every new combination of old elements gets a new result, but this is not the sense in which the phrase is rightly used as indicative of invention. The recent opinion of this court in *Huebner Co. v. Matthews Co.*, 253 Fed., 435, illustrates this situation. The ultimate practical result at which the patentee and his predecessors aimed was to carry packages by gravity upon a runway from one place to another. The patentee was the first to accomplish this with such a degree of efficiency as to make the device commercially popular, but the same result, except in efficiency degree, had several times been reached before, and by apparatus so similar as to be superficially indistinguishable. The patentee had simply added the well-known and common mechanical refinements and expedients already used by others even in the same art, *e. g.*, he used roller bearings instead of ordinary journal boxes, and we declined to regard this as a new result. We have no intention to depart from that line of our recent decisions (4) of which this one is typical; such refinements are not inventions. On the other hand, we recall no instance of combinations of old elements which has been held to produce "a new result" in a patentable sense and which better deserves that commendation than does Callahan's. The quasi-automatic elevation and

(4) E. G.—Berger Co. v. Trussed Co., 257 Fed. 741; Edwards v. Dayton Co., 257 Fed. 980; Van Dorn Co. v. Mathis Co., 260 Fed. 400.

distribution of wet concrete under the varying conditions of progressive building and by a single apparatus was an entire novelty. No one had tried to do it; apparently, no one had thought of it; it was useful in a very high degree; and when we find a new result in this complete and extreme sense accomplished by a confessedly new combination,—though of known means,—we think both the purpose of the patent law and the rightful application of the decisions thereunder require that it should be awarded the merit of invention.

We have stated our conclusion that the device of the patent is not an aggregation in the sense that it represents such a mere assembling of old elements as might have been made by the exercise of only ordinary skill. It is at least equally clear that the device is not an aggregation in the more technical sense of the word, but is rather a true combination. It is true that the use of the apparatus involves successive steps, and is at each of its stages under direct or indirect manual control; but, in a fair sense the entire operation of elevating and distributing concrete is a unitary thing. From the time it starts on its journey from the ground to the time it is deposited in the forms, its progress might well be automatic. There is clear distinction between this performance and that of the associated washing and wringing machines, discussed by the Supreme Court in *Grinnel Co. v. Johnson Co.*, 247 U. S., 426. In the latter case, both the judgment and the hand of the operator were involved, in submitting to the second operation the material which had finished the first; the juxtaposition of the two machines was a mere matter of convenience; in the present case, the operator can, at the most, only interfere to prevent the otherwise normal completion of second part of what is

intended to be the unitary work; and even then his interference will only temporarily stay the normal action. We collected and commented on the decisions of the Supreme Court and other courts on this subject, in *Gas Co. v. United Co.*, 228 Fed., 684. Callahan's patent should not be condemned as an aggregation.

We do not overlook the fact that some, and perhaps a considerable portion, of the practical and commercial success has been due to the use of the feature covered by the Smith patent; but this does not detract from the patentable and inventive merit of Callahan's idea. An oscillating or swinging chute, even without Smith's secondary swivel, would make the primary distribution of the concrete throughout the floor or level, leaving the secondary and more accurate distribution to be accomplished by further means. We have held that the particular means adopted by Smith did not involve invention, and we can hardly say that much of the credit due to public use should be taken away from Callahan because he had not himself adopted an improvement and refinement which, however important to commercial success, was within the grasp of the men ordinarily skilled in the art.

We have considered claim 5. Claims 1, 2 and 13, also in suit, use more general terms and are superficially somewhat broader, but we think in connection with the specification they necessarily intend that the means for *receiving the concrete from the raising means and taking it to the conduit are vertically adjustable in the tower.* This may fairly be implied from the requirement that the material is to be raised to a "suitable point" in the tower. It is then seen that all these claims involve what we have thought Callahan's meritorious invention, resting upon the succes-

sive story by story operation of the device. With this interpretation, they are not very different from claim 5, but should be treated as other expressions of the same thought in terms nominally of somewhat broader equivalency. These claims, also, should be considered valid.

Infringement is not denied.

The decree below, as entered, must be set aside and the record remanded for a new decree modified in accordance with this opinion.

No. 3241.

IN THE

UNITED STATES CIRCUIT COURT OF APPEALS
FOR THE SIXTH CIRCUIT.

CONCRETE APPLIANCES COMPANY, *et al.*,
Plaintiffs and Appellants,
v.
DIETRICH MEINKEN, *et al.*,
Defendants and Appellees.

ON REHEARING
PETITION

March 2, 1920.

DENISON, Circuit Judge: The application for rehearing brings to our attention a matter not mentioned in the opinion. We selected claim 5 as the one most suitable for study, because it expressly incorporated those features in which we thought patentable novelty was to be found. One of these features was the horizontally movable boom carrying the conduit, and "being adjustably connected with the tower and adapted to be arranged at various positions in the height thereof." We assumed that this referred to a *vertical adjustment of the boom in the tower.* The assumption is now challenged, because it is said that the adjustable connection between the boom and the tower was that mechan-

ism which provided for a horizontal adjustment of the upper end of the boom on a horizontal track (which defendant has not used), and that the provision for vertical change of the boom in the tower is not adjustability, but rather refers to a dissembling of the parts in one location and reassembling them in another. It is true that the specification refers to a horizontal adjustability, but we do not think that it is this capacity to which claim 5 refers—at any rate, this inference is not clear enough to justify limiting the claim to a comparatively unimportant detail. Such an inference is contradicted both by the fact that this horizontal adjustability of the boom on the tower is made the special characteristic of a group of claims not in suit, and by the fact that the thought is stated in the claim in immediate connection with the reference to "various points in the height" of the tower, and after one reference has been made to the horizontal motion of the boom and the reference to that function apparently finished, while the draftsman turned to the thought of vertical change. It is true, also, that in the form of the invention shown in the drawings and specifically described, the vertical change was to be made by taking out bolts, removing the horizontal platform, raising it and bolting it again to a new position, and that this is not adjustability in the most precise definition. However, it is well within the sense in which the word is very often used, and we must define it as the patentee intended. For these reasons we adhere to the interpretation of the claim in this respect which the opinion assumed.

It is also true enough that Callahan specifically contemplated building his tower up section by section, as the building progressed; but this was a matter of preference. His drawing shows the completed tower, permitting operation

anywhere along its height, and observation of his plan of erection does not change our conception of the real disclosure.

In other respects, further review of the case leaves our stated conclusions unchanged, and the application for rehearing will be disallowed.

We note that the reference to a mixer, found in line 35, on page 8, is erroneous. The phrase should read "deliver it from the ground all about, etc." In line 31, p. 10, "mixer" should be "ground." In the last line of page 7, "adjustable" should be "adjustably connected." The clerk will make the corrections in the opinion on file.

APPENDIX B.

IN THE

UNITED STATES CIRCUIT COURT OF APPEALS FOR THE THIRD CIRCUIT.

March Term, 1923.

CONCRETE APPLIANCES COMPANY AND WILLIAM H. INSLEY,
Plaintiffs-Appellant,
vs.
JOHN E. GOMERY, JOHN C. SHWARTZ, MICHAEL J. O'MEARA AND CONCRETE CONSTRUCTION COMPANY,
Defendants-Appellants.

No. 2982

Appeal from the District Court of the United States for the Eastern District of Pennsylvania.

Before BUFFINGTON, WOOLEY and DAVIS, Circuit Judges.

BUFFINGTON, Circuit Judge.

In principle, this case concerns the use of gravity in conveying mobile substances from an elevated common central point to various working points; in application, to the distribution of "wet" or "mush" concrete.

Referring to the above general principle of conveying mobile matter by gravity, we have the age-worn practice of lifting water by power to a reservoir and by gravity distributing it through conduits to a fixed point or by hose to diverse points. In other words, the problem of lifting it to a gravity-sufficient height; of there accumulating it in storage; from thence conveying it by conduit to a determined place or by hose to an optional point of use. Naturally such general practice was early applied to the movement of such a mobile matter as grain when its volume became large and the word "elevator" became a synonym for the raising, storage and distribution of grain, into individual cars, the ends of the same car, into ships, and indeed into separate hatches.

As an example of the common practice the proof is that prior to 1905 and since then, practically all elevators delivering grain to ships have been equipped with pipes, extending downwardly from the side of the elevator and supported by horizontally movable booms for directing the outlet of the pipes to any desired part of the boat, within range of the apparatus. But not only was such movable conduit's discharge pipe handled by the boom on the elevator, but where the change of the tide or the lower level of the ship, caused by loading, made it desirable, a second or supplemental hopper and an additional spout were suspended from and handled by a boom and tackle on the ship itself. This supplemental hopper received the discharge from the elevator spout, and discharged it into the vessel as change of tide or the settling of the vessel necessitated. The proofs further show that where two ships were lying side by side and it was desired to spout the grain to an outlying, or "second-off" one, it was done by such elevator appliances in spite of the long stretch required. It was also a common practice

to provide the spout with a telescopic extension end by which further horizontal reach was effected, due to the varying positions of the ship. Moreover, it will be noted that on such apparatus the function of the boom was not only to raise, lower and swing the spout to reach the hatches of the ship under different conditions of load and tide, but also to draw up and house the spout so as not to interfere with the navigation or movement of the vessel.

The same general type of grain elevator appliance was used for loading cars. The proof is that "the hopper ends of the spouts were constructed with an enlargement, forming hoppers, and grain spouts were connected to them in the elevators. * * * All types of movable and fixed spouts were used in grain elevators at that time, of the movable type, those in the grain elevators were either portable or so constructed that they revolved around a fixed point. * * * Outside of the buildings they had spouts for shipping grain to cars, which were generally fixed in position with a telescope and either with one opening or two, so arranged that grain could be thrown into either end of the car." Without further statement, it will be seen that the steps of lifting grain to get gravity; of storing to get quantity; or chuting to get delivery; and of boom swing and trough shift to vary locality of delivery; and also of duplication of these shore appliances by supplemental boom and conduit on shipboard; had all been advanced to a high state of efficiency and delivery point variation in elevator grain practice.

The same may be said of coal practice, the proofs showing the contemporaneous use of "coal chutes in connection with coal elevators in stock piles, where the coal was elevated and spouted out through the side of the building into

a stock pile and into bins. The spout would be supported in a similar manner to the spouts heretofore referred to as shipping spouts in connection with grain elevators," this, "that the spout could swing in any direction and was suspended from a swinging boom."

Later, when concrete docks, piers and the like came to be built, it was quite natural for contractors to use in building them the apparatus used for grain chuting and to handle and chute concrete in the same way. And such, the proofs show, was the case as will be seen by reference to but one or two operations. In November, 1906, a concrete foundation for an intake and pumping station was built by the Great Lakes Dredge and Dock Company at Gary, Indiana. Here a car was used on which was a mixer from which the concrete was discharged into a hopper or chamber and from which chutes suspended from a boom located on the car, chuted the mixed concrete down to the coffer dam where it flowed either into piles or was poured in place, the dam being some forty feet in width and of great length. The chutes in the apparatus would be moved up, down and sideways. The apparatus was used for several months and was constructed by a man who had never seen concrete so handled, but had seen it used in grain elevators. In addition to the testimony of the builder of this apparatus, another witness testified as follows:

> "The first apparatus we used was a concrete mixer set on a flat car, and the concrete was spouted from the mixer into the bottom of the excavation. We called it chutes then. There was an improvement made on this apparatus to distribute the concrete from one location to another within a radius controlled by a boom holding the chutes or spouts. The ends of the spouts were—the location of the

ends of the spouts were placed by swinging the boom that carried the concrete spouts."

The same man the next year used similar apparatus in building a concrete dock at the same place. In this case the apparatus was placed on a scow, a mast being placed in front of a mixer, a boom placed on such mast and a chute suspended by tackle therefrom. As to its mode of operation the constructor testified:

> "It is dumped out of the mixer into a bucket, and conveyed up with a cable in a bucket, and dumped into a hopper which is fastened on the tower; and we have one 50 foot section of 12-inch pipe carried by two booms and fastened on the bottom of the hopper, and as occasion requires placing concrete in forms, we have 8-foot sections or 10-foot sections to take on or off.
>
> Q. How could you change the point of delivery of the lower end of the pipe?
>
> A. By adding on a section 10 feet long, or taking it off, as occasion required.
>
> Q. Was there any other way to change the point of delivery?
>
> A. By swinging booms and swinging pipe.
>
> Q. Was this apparatus successful?
>
> A. Very successful."

Another witness described it thus:

> "This apparatus is a concrete equipment built on a scow, consisting of a concrete mixer at the proper elevation so that concrete could be spouted into the concrete dock; and above the mixer was constructed two hoppers, one for stone and one for sand, this being at one end and the other end of the scow being the cement shed. A boom was placed to support the chute, for the porpose of raising the spout so that the concrete equipment could be moved—I meant to

> state for the purpose of spouting the concrete in the forms for the dock, and also to raise the spout when moving the equipment ahead."

He further testified that the number of chute sections used was determined by the distance from the mixer to the concrete forms and that as much as five or six such sections were used on this work and that the dock itself was five thousand feet long.

There is proof of the use at San Francisco Harbor in 1904-5-6 of substantially similar concrete chuting apparatus placed on a scow. It clearly shows the use of chutes moved to different positions by a boom. A witness thus describing the boom's action, said:

> "Well, the boom is the bottom end of it, and sets in a hinged socket, I would call it, and the outer end has a sheave in the end of it, the cable runs from the donkey engine to the sheave in the outer end, which is used to handle the pipe that carries the cement to the cylinders. All the use of this boom is to handle the pipe that carries the cement."

Moreover, a study of the proofs satisfy us that from the time concrete came into use there had been a struggle between the architects and designers, who, as a class, favored the use of dry concrete which would not flow, and the contractors, who, for construction convenience favored wet or mush concrete, which would flow and therefore allow the use of distribution chutes, and that as soon as the use of wet concrete became general, the art used the wet concrete chutes, which it could not use for the dry. In that regard, the proof was that "The more reinforced concrete came into use, the more contractors used wet concrete; and I should say that from 1908 on on very much the greater portion of

reconstruction work was done in concrete than before; hence, also, the more wet concrete was used since that time." In these evolutionary stages of the concrete art, the proof is that the builders of grain elevators took a leading part in the use and distribution of wet or mush concrete. In that regard, the proof is:

> "Architects in general prior to the year 1904-05 demanded that concrete be mixed what is known as very dry; and to such a consistency that it required considerable tamping to make the water flow on top; but grain elevator designers and contractors have never been governed by architects' rules and guidance or specifications, as the elevator designer generally built the elevator that he designed, or that some other company designed; therefore they were a sort of law to themselves, and, in my opinion, were the first designing engineers and contractors to use what is known in the trade as 'wet' or 'sloppy' concrete. In my opinion this was brought about by the use of what is called 'slip' or 'movable' forms. By the use of such form, which is usually about 4 feet high, the wall, column, or girders, is formed by filling the movable form with sloppy concrete and reinforcing, and at the same time, constantly raising the form by a series of jack screws supported on steel bars, which are imbedded in the concrete. The jack screws are fastened into these bars, and by turning down the jack screws the form is forced up; this making the structure one monolithic mass; but to do this the concrete had to be run into the form in a liquid state, and such a liquid state that it did not require tamping, but only spading.
>
> * * * * * * *
>
> From the mixer the concrete was spouted into a hoist hopper. This hoist hopped was hoisted by a power to the top of the building as it was in course of construction. When reaching the top a gate, which was provided on the side of the first hopper, was opened and the concrete material allowed to dis-

charge through a spout into another similar hopper, but stationary. This last named hopper was usually located about from 15 to 20 feet away from the side of the hoist tower, and in the elevator work was supported on the movable form. From this hopper the concrete was drawn into wheelbarrows or concrete carts, and with these distributed into the various walls, columns and floors."

An engineering witness described the evolution and growing use of wet concrete in this way:

"About 1902, there was considerable agitation among engineers of all kinds dealing with foundations, as to wet or dry concrete. The engineering fraternity was divided into two camps about that time, one advocating a concrete mixed quite dry and thoroughly tamped, and the other advocating using a concrete mixed quite wet or mixed to a consistency which would enable it to flow easily, and which did not require tamping after being placed. This agitation to my knowledge, extended over a period of about five years, the wet fellows arguing that from a constructional standpoint the concrete was easier and more cheaply placed and made a more dense bixture. About this time, also, 1902, I joined the Western Society of Engineers and attended the meetings quite frequently, and heard papers read by different engineers on both sides of the question. The use of reinforcing steel in concrete became more customary about 1902, and a former professor of civil engineering of the University of Illinois, Prof. Pence, read a paper before the Western Society of Engineers, describing tests he had made as to the expansion coefficient of concrete, with relation to the expansion of steels.

* * * * *

These experiments brought out the fact that it was possible to use steel and concrete together, so far as the expension coefficient was concerned, and following this with the increased use of reinforcing

> steel in concrete it was almost imperative that a wet concrete be used in order to have it properly placed around reinforcing steel. Really, according to my opinion, the introduction of reinforcing steel made it imperative that concrete more of a consistency of liquid be used in order to build the structures then being designed, and this fact made it imperative that in handling this liquid concrete the chute or trough come into play."

Sensing the gradual increased use of the concrete art through these experimental years, it would seem from the proofs that the grain elevator contractors led the way in the broader use of mobile concrete and that as the engineer determined the co-efficient of relative expansion of steel and concrete was such as to permit their joint use in reinforced building construction generally, the consequent and indeed the insistent call for the use of wet or fluid concrete became more imperative, because such concrete could be better placed around reinforcing steel and that this use of fluid concrete naturally brought with it the employment of fluid carrying troughs.

This insistent call for wet concrete was evidenced by the building requirements made by the City of San Francisco after the earthquake and fire catastrophe. In that regard an experienced engineer who went there from the East to study building conditions testified:

> "There are so many different types of buildings in old San Francisco, but, roughly, the most decided change, I believe, was the general adoption of more concrete in the construction of the new buildings. As a rule concrete was substituted for former brick and tile construction wherever possible. Shortly after the earthquake two types of buildings were officially recognized by San Francisco, and generally

through California, i. e., class A type, which consisted of a steel frame fireproofed by concrete; and class B building, which consisted almost entirely of reinforced concrete. This necessitated the more general use of wetter concrete than had been practiced heretofore, as walls and floors and fireproofing were of the minimum thickness allowed by safety, and could not be constructed with the older methods of dry concrete."

It is no reflection on the patent office of the United States, but simply an instance of how often the theoretical expert of an art is in his office oblivious to the atmosphere of practical accomplishment in the field of achievement, when we note that, unconscious of this wide, growing and much discussed use of wet cement, the patent office, on November 2, 1909, granted patent No. 939,072 to A. D. Ney, which was based on the specification statement by him made July 10, 1909, that "In the making of concrete, it has hitherto been the general practice in mixing the materials as stiff as possible, using only sufficient water to cause the adherence of the material together, and thereafter tamping the material to cause the mass to be as compact as possible in its relatively dry condition. In the operation of making the product of the present invention, a *radically different method is followed in that an abundance of water is employed* in order not only to permit gravity to bring the mass to a solid, compact condition and thereby dispense with the ramming operation, but also to provide sufficient water for the purpose of crystallization. The process of forming the present process is essentially *a wet process,* and distinguished from the relatively *dry process employed* in making concrete."

In the actual state of the working art which the proofs quoted above show in fact existed, and with the measure of the art, as evidenced by the Nay patent above quoted, then held by the patent office, Callahan and a number of other alleged inventors, who thereafter were thrown into interference with each other, applied for patents which had in view the spouting or chuting of wet concrete. Without attempting to settle the questions of priority between these claimants, we may say that the period which embraces their several dates is confined to a comparatively narrow compass and to our mind they all serve to show that at or about the same time the natural mechanical evolution of the concrete art and the possibility of the use of wet concrete mechanically, but instinctively, led all these men to adopt the same general types of mechanical appliances for the chuting of wet concrete. It is a situation to which we feel we may re-apply what was said by this court in *Elliott vs. Youngstown*, 181 Fed. Rp. 349: "Nor is it necessary to dwell upon the suggestion that applications were made for blue print machines with an automatic cut-off by four different inventors about the same time, Fullman and Herman among the rest. The fact that so many persons caught the idea goes rather to prove that it was simple and obvious, and not that it required inventive genius to conceive. It is not like the case where the art is waiting for the device, and inventors striving unsuccessfully to produce it, under which circumstances invention may well be held to appear."

Restricting ourselves therefore to the single one of these group inventors, we note that on January 21, 1909, Lee Callahan applied for, and on February 8, 1910, was granted patent No. 948,719, here in suit, for a material transferring apparatus. As stated in the specification, Callahan's alleged

invention had "for its general object to provide an apparatus calculated to be used to advantage in transferring concrete or other plastic material from a suitable source of supply to points desired on a building that is being built." It also stated a second general purpose was "to provide an apparatus of the kind stated adapted more especially for use when a building is to embody reinforced concrete." And likewise a third, viz: "for transferring other material from the ground to the points desired on a building in course of construction." On his apparatus, Callahan was allowed the claims here in question, viz: 1, 2, 5 and 13, of which the first reads:

> "An apparatus for the purpose described, comprising a tower, a suitably supported horizontally movable boom connected therewith, a conduit carried by the boom, means for raising plastic material to a suitable point in the height of the tower, and means for receiving plastic material from said raising means and conducting the same to said conduit."

This is fairly illustrative of the elements of the other three claims. The elements of the quoted claim are first "a tower"; second, "a suitably supported horizontally movable boom connected therewith"; third, "a conduit carried by the boom"; fourth, "means for raising plastic material to a suitable point in the height of the tower," and, fifth, "means for receiving plastic material from said raising means and conducting the same to said conduit."

Comparison of Callahan's apparatus with the prior art shows that it really constituted no advance over that art, but on the contrary, rather a step backward. For example, he either had no knowledge of the use of the open trough

or chute, or if he had he made no mention of it or suggestion of its possible use, confining his specification and limiting his claims to "a conduit" or closed pipe. And the proof is that this closed conduit of his claim soon proved worthless on account of clogging and had to be supplanted by the open chute of the earlier art. There was of course nothing new in his element of his elevating tower. That was as old as the elevator art. Making it extensible from story to story involved no more invention than if he had built his tower complete at the start and allowed his building to build up to tower height instead of the tower to the building height. His means to convey the material up the tower was only another name for an elevator cage or container of suitable form and capacity. A receptacle for storage at the top was a common practice in grain and coal devices and a boom to carry a chute or trough was common in the grain and concrete arts. In fact, we are unable to find any element of novelty either in the separate elements Callahan used or in the unification of such elements in the apparatus he suggested. Had the actual state of the prior art been shown to the patent authorities we cannot feel they would have granted this patent and while we feel embarrassed to find ourselves at variance with the Circuit Court of Appeals of the Sixth Circuit, which in the case of *Concrete Appliances Co., et al. v. Meinken et al.*, 262 Fed. 958, found this patent valid, we feel assured that the meager record before that court wholly failed to disclose the now uncontradicted proofs on which we base our conclusions.

In the advance in the concrete building art with the extension towers to great heights and chutes to great distances, the very magnitude and scale of the work are such as to impress the onlooker and there is danger of one's be-

ing misled by their very magnitude into the belief that they must involve invention, but when their principle is sensed it will be found the known principle and practice which marked the art long before this patent, have simply enlarged as construction enlarged its operation. That growth is in this case due to the appreciation of wet concrete and convinced as we are that in roads, piers, docks, bridges and buildings generally, concrete is the growing material of the future, we believe its advance should be in no way embarrassed by this patent by which the art is now sought to be blanketed. The court below held the patent was not infringed; we go a step further and hold Callahan, so far as the claims here involved are concerned, had no such patent claims to infringe. The cause will therefore be remanded to the court below to modify its decree by adjudging the claims in controversy invalid and as thus modified the decree is affirmed.

APPENDIX C.

IN THE

UNITED STATES CIRCUIT COURT OF APPEALS FOR THE THIRD CIRCUIT.

March Term, 1923.

CONCRETE APPLIANCES COMPANY, *Appellant,*

vs.

J. E. GOMERY, ET AL., *Appellees.*

No. 2982

Appeal from the District Court of the United States, for the Eastern District of Pennsylvania.

This cause came on to be heard on the transcript of record from the District Court of the United States, for the Eastern District of Pennsylvania, and was argued by counsel.

On consideration whereof, it is now here ordered, adjudged and decreed by this court, that the decree of the said District Court in this cause be, and the same is hereby mod-

ified so as to adjudge the claims in controversy invalid, but otherwise affirmed, with costs.

Philadelphia.
July 24, 1923.

(sgd.) VICTOR B. WOOLLEY,
Circuit Judge.

On an application with respect to costs seasonably made within the term of the decree, the above order is vacated.

(sgd.) VICTOR B. WOOLLEY,
Circuit Judge.

Received and Filed
Jan. 23, 1924.
SAUNDERS LEWIS, JR.,
Clerk.

APPENDIX D.

IN THE

UNITED STATES CIRCUIT COURT OF APPEALS
FOR THE THIRD CIRCUIT.

March Term, 1923.

No. 2982.

CONCRETE APPLIANCES COMPANY AND WILLIAM H. INSLEY,
Appellants,

vs.

JOHN E. GOMERY, JOHN C. SCHWARTZ, MICHAEL J. O'MEARA,
AND CONCRETE CONSTRUCTION COMPANY,
Appellees.

Having heard and considered the application of the appellants that the costs in this cause, taxable against them, be limited to such as were actually paid by the defendant users of the alleged invention of the patent; and being of opinion that the manufacturer which supplied the defendants with the alleged infringing appliances and openly de-

frayed in part the expenses of this litigation are to that extent privy to the action.

IT IS on this thirty-first day of January, 1924,

ORDERED, adjudged and decreed that this cause be remanded to the District Court of the United States for the Eastern District of Pennsylvania, that the said court modify its decree by adjudging the claims in controversy invalid, and as thus modified the decree is affirmed, with costs to the appellees covering their proper disbursements as users and the proper disbursements of the manufacturers supplying them with the alleged infringing appliances.

VICTOR B. WOOLLEY,
Circuit Judge.

IN THE

Supreme Court of the United States

OCTOBER TERM, 1923.

CONCRETE APPLIANCES COMPANY AND WILLIAM H. INSLEY, *Petitioners*,
vs.
JOHN E. GOMERY, JOHN C. SCHWARTZ, MICHAEL J. O'MEARA, AND CONCRETE CONSTRUCTION COMPANY, *Respondents*.

No. ——

NOTICE OF SUBMISSION.

To WM. STEELL JACKSON, ESQ.,
Counsel for Respondents.

Please take notice that on Monday, March 17, 1924, we shall submit the accompanying petition for writ of certiorari to the Supreme Court of the United States, at the Capitol, Washington, D. C., at the opening of Court on that day, or as soon thereafter as counsel can be heard.

ARTHUR M. HOOD,

STEPHEN J. COX,
Counsel for Petitioners.

Service of the above Notice of Submission, and receipt of five copies of the accompanying Petition for Writ of Certiorari and Brief in support thereof is acknowledged this 3rd day of March, 1924.

Counsel for Respondents.

SEP 30 1925
WM. R. STANSBURY

IN THE

SUPREME COURT OF THE UNITED STATES

OCTOBER TERM, 1924

No. [redacted]44

CONCRETE APPLIANCES COMPANY and WILLIAM H. INSLEY

Petitioners

v.

JOHN E. GOMERY, JOHN C. SCHWARTZ, MICHAEL J. O'MEARA, and CONCRETE CONSTRUCTION COMPANY

Respondents

BRIEF FOR PETITIONERS

ARTHUR M. HOOD
STEPHEN J. COX
CYRUS N. ANDERSON
Counsel for Petitioners

Appeal Printing Company, 32 Thomas Street, New York City

INDEX.

PAGE

Combination of patent involved invention 59
Conclusion 85
Costs 78
Date of invention by Patentee 26
Decision of Court in Third Circuit 75
Decisions compared 69
Emptman Alleged Prior Invention 62
Errors assigned 15
Grain Elevator Spouting 55
Infringement 16
Inoperativeness of Callahan apparatus, alleged 67
Interferences, effect of 63
Patentable combination of old elements 59
Prior art 44
Prior Patents 58
Prior Printed Publications 57
Statement of the Case 2
Subject matter of the Patent 7
Appendix A 86
Appendix B 102
Appendix C 115
Appendix D 117

CASES CITED.

American Tobacco Co. *v.* Kryptok, 83 Fed. 703 60
Ansonia Co. *v.* Electrical Co., 141 U. S. 11, 18 91

Brown & Sharpe *v.* Starrett, 225 Fed. 997 26
Burrow *v.* Kansas City, 54 Fed. 278 81

Cadillac Co. *v.* Austin, 225 Fed. 990 60
Capital *v.* National, 70 Fed. 709 25
Concrete Appliances Co. *et al. v.* Meinken, *et al.*, 263 Fed. 958 111
Corpus Juris, Vol. 15, p. 175 81
Cropp *v.* Standard, 256 Fed. 668 64
Crown Co. *v.* Sterling Co., 217 Fed. 381 89
Cummings *v.* Akron Cement, etc., 6 Blatchf. C. C. 509 81

PAGE

Delaski Co. *v.* Fiske Co., 203 Fed. 986 44

Elliott *v.* Youngstown, 181 Fed. 349 111
Engineer Co. *v.* Hotel Astor, 226 Fed. 783 26
Expanded Co. *v.* Bradford, 214 U. S. 366, 381 96

Ferro Concrete Co. *v.* Concrete Steel Co., 206 Fed. 666 96

Gas Co. *v.* United Co., 228 Fed. 684 98
General Electric Co. *v.* Alexander, 277 Fed. 300 61
Gold *v.* Newton, C. C. A. 2-254 Fed. 824-827 94
Grinnell Co. *v.* Johnson Co., 247 U. S. 426, 38 Sup. Ct. 547, 62 L. Ed. 1196 72-98

Hobbs *v.* Beach, 180 U. S. 383-390 94
Huebner Co. *v.* Matthews Co., 253 Fed. 435 96

International *v.* Brammer, 138 Fed. 396 25
International *v.* Sievert, 213 Fed. 255 96

Jackson Fence Co. *v.* Peerless, 228 Fed. 691 55

Lemley *v.* Dobson-Evans Co., 243 Fed. 391 88
Loom Co. *v.* Higgins, 105 U. S. 580 60-96

Mineral Separation Co. v. Hyde, 242 U. S. 61, L. Ed. 286 68
Morgan Co. *v.* Alliance Co., 176 Fed. 100-109 96

National Co. *v.* Aiken, 163 Fed. 254-259 82

O'Neil *v.* Railroad Co., 31 Fed. 663 96

Potts *v.* Creager, 155 U. S. 597, 606-8 94
Proudfit Co. *v.* Kalamazoo Co., 230 Fed. 127 59

Reed *v.* Cropp, *et al.*, 239 Fed. 869 65
Rosemary Co. *v.* Halifax Mills, 257 Fed. 222 60

Shaw Electric Crane Co. *v.* Shriver, 80 Fed. 640 82
Stead Lens Co. *v.* Kryptok, 214 Fed. 376 61
Steffins, *et al. v.* Steiner, 232 Fed. 862-864 82

Warren *v.* Oswosso, 116 Fed. 309 96
Worcester v. Handy, 232 Fed. 49-65 81

Supreme Court of the United States

OCTOBER TERM, 1924.

No. 307.

CONCRETE APPLIANCES COMPANY AND WILLIAM H. INSLEY,
Petitioners,

v.

JOHN E. GOMERY, JOHN C. SCHWARTZ, MICHAEL J. O'MEARA, AND CONCRETE CONSTRUCTION COMPANY,
Respondents.

BRIEF FOR PETITIONERS.

Jurisdiction.

The jurisdiction of this Court is invoked under sec. 240 Judicial Code, on the ground that the Circuit Court of Appeals, for the 6th Circuit, has held the patent in suit No. 948,719 of February 8, 1910 valid as to claims 1, 2, 5 and 13 (*Concrete Appliances Co. et al.* v. *Dietrich Meinken, et al.*, 262 F. R. 958) and the Circuit Court of Appeals for the 3rd Circuit has held the same claims invalid (*Concrete Appliances Co. et al.* v. *John E. Gomery, et al.*, 291 F. R. 486). The first decision was rendered January 26, 1920 and March 2, 1920, and the second decision—in the present case—was rendered July 24, 1923 and January 31, 1924 (R. pp. 933-941).

Both opinions are printed as appendices (see A, B, C and D) to this brief.

The petition for certiorari was filed in this Court March 5, 1924, and granted April 7, 1924.

Statement of the Case.

This suit was brought in the District Court for the Eastern District of Pennsylvania for the infringement of the Callahan patent Number 948,719 of February 8, 1910, and was dismissed for non-infringement (R. 645-653, and 284 F. R. 518). The Circuit Court of Appeals for the Sixth Circuit in 1920 held the patent valid as to certain claims (262 Fed. Rep. 958) and the Circuit Court of Appeals for the Third Circuit has now held the patent invalid as to the same claims (291 F. R. 486). The writ of certiorari was granted in order that this Court might determine the conflict.

The facts are as follows:

This suit, alleging infringement of claims 1, 2, 5 and 13 of the Callahan patent No. 948,719 of February 8, 1910 for "Material Transferring Apparatus" (R. Exbt. N, Vol. II, pp. 634-635), was brought by the petitioners, Concrete Appliances Company and Wm. H. Insley, the patent owner and licensee, respectively, in the District Court of the United States for the Eastern District of Pennsylvania, against the respondents John E. Gomery, John C. Schwartz, Michael J. O'Meara and Concrete Construction Company, by Bill of Complaint filed July 19, 1920 (R. 5).

The said United States District Court, in a final decree entered November 20, 1922, dismissed the Bill of Complaint (R. 653), pursuant to opinions filed June 13 and October 31st (R. 645 and 650, also 284 Fed. Rep. 518), in which it was held that the defendant's apparatus did not infringe.

The petitioners thereupon appealed to the United States Circuit Court of Appeals for the Third Circuit, which appeal came on for hearing, before Buffington, Wooley and Davis, Circuit Judges, and the Court, on July 24, 1923, filed an opinion and order finding the patent invalid and affirming the decree of the said District Court as modi-

fied (R. 933 and 291 F. R. 486). Thereupon and on August 1st, 1923, the petitioners requested the Court to reconsider the questions relating to the matter of costs, and this request was granted and the issuance of the mandate withheld. The Court held the matter under consideration until January 23, 1924, when it made an order vacating the order of July 24, 1923 (R. 941). The Court then, on January 31, 1924, made an order modifying and affirming the decree, directing that the cause be remanded to the District Court and directing "that the said Court modify its decree by adjudging the claims in controversy invalid," and further providing that "as thus modified the decree is affirmed, with costs" (R. 941). The said opinion of the Court of Appeals of July 24, 1923, orders of July 24, 1923 and January 23, 1924, and decree of January 31, 1924, are printed in the appendix to this brief and marked "B," "C" and "D," respectively.

Prior to the decision in this suit, the said Callahan patent had been held valid as to the same claims involved in this suit (1, 2, 5 and 13) by the Circuit Court of Appeals for the Sixth Circuit (262 Fed. Rep. 958, Warrington, Knappen and Denison, Circuit Judges), in a suit brought by these petitioners, by Bill filed August 7, 1916, against Dietrich Meinken, Roy C. Owens, and George B. Curd, in the District Court of the United States for the Southern District of Ohio, Western Division, in opinions filed January 6, 1920, and, on petition for rehearing, March 2, 1920. The said opinions of the Circuit Court of Appeals for the Sixth Circuit are printed in the appendix to this brief and marked "A." In that suit the said District Court held the said claims of the patent invalid, and this petitioner appealed to the Circuit Court of Appeals for the Sixth Circuit, which resulted in the decision sustaining the validity of the said claims of the patent. The opinion of the District Court is found at pages 43 to 46

of the record in the Circuit Court of Appeals for the Sixth Circuit (offered R. 118) which is a physical Exhibit in the present suit, marked "Joint Exhibit for Plaintiffs and Defendants," and is before this Court as such with the record of this suit.

The decision of the Circuit Court of Appeals for the Third Circuit does not sustain the District Court on the question of infringement, but says:

> "The Court below held the patent was not infringed; we go a step further and hold Callahan, so far as the claims here involved are concerned, had no such patent claims to infringe." (Opinion last par.)

It is thought that the lower Court placed an extremely narrow construction upon the claims of the patent in suit, and then held the said claims not infringed, because he considered the patent invalid but did not wish to take issue with the Court of Appeals for the Sixth Circuit, and in order that the plantiff might be required to assume the burden of the appeal. That he regarded the patent as invalid unless "limited to the specific special construction which the patentee devised" is expressly stated in his opinion (R. 648). If therefore, the decision of the Circuit Court of Appeals for the Sixth Circuit holding the patent valid is correct, the patent must be construed with reasonable breadth, and as thus construed must be infringed. There does not appear to be any serious issue as to infringement here.

The conflict between the decisions of the Sixth and Third Circuit Courts of Appeals is shown by the language of the two opinions. Thus the Circuit Court of Appeals for the Sixth Circuit, referring to the same claims which were before the Circuit Court of Appeals for the Third Circuit, said (262 Fed. Rep. 958, 965):

> "On the other hand, we recall no instance of combinations of old elements which has been held to produce 'a new result' in a patentable sense and which better deserves that commendation than does Callahan's. *The quasi automatic elevation and distributing of wet concrete under the varying conditions of progressive building and by a single apparatus was an entire novelty.* No one had tried to do it; apparently, no one had thought of it; it was useful in a very high degree; and when we find a new result in this complete and extreme sense accomplished by a confessedly new combination—though of known means—we think both the purpose of the patent law and the rightful application of the decisions thereunder require that it should be awarded the merit of invention." (All italics ours, unless otherwise stated.)

The Circuit Court of Appeals for the Third Circuit, referring to the same claims, and to the same combination of old elements (Opinion next to last par.):

> "In fact, we are unable to find any element of novelty either in the separate elements Callahan used or in the unification of such elements in the apparatus he suggested."

The conflict therefore arises from the holding of the Sixth Circuit Court of Appeals that Callahan's apparatus was not for a mere aggregation of old parts but for a patentable combination, and the holding of the Circuit Court of Appeals for the Third Circuit that there was no novelty and nothing patentable in that combination.

The records before the two Courts of Appeals are believed to be substantially the same, so far as they relate to the question of aggregation or invention. The record in the Sixth Circuit Court of Appeals contains *fifteen* prior United States and British patents, granted at various times between the years 1864 and 1907, and the record in

the present suit contains *thirty-seven* United States and British Letters Patent granted during the same period, including thirteen of the fifteen patents found in the first record. The thirteen patents in the present record which were before the Sixth Circuit Court of Appeals are the following:

		PAGE
No. 445,645	Simpson	684
" 464,101	Mayo	688
" 582,598	Bird	707
" 622,019	Robinson	714
" 524,984	"	693
" 702,372	Montgomery	737
" 718,092	Clarke	798
" 753,616	Nicholson	807
" 760,015	Parker	811
" 866,166	Theiss, *et al.*	832
British Patent No. 1,124 of 1864 to Potter		872
" Patent No. 2017 of 1880 to Johnson		892
" Patent No. 10,380 of 1988 to Baillie		899

The additional patents in this record are believed to be merely cumulative, and to add no new element of importance to the elements shown by the patents of the earlier record, which were fully considered by the Court of Appeals for the Sixth Circuit when it rendered its decision sustaining the validity of the patent.

The present record contains much evidence relating to prior uses which was not before the Court in the Sixth Circuit, but these prior uses are thought to be substantially uses of the apparatus shown in the prior patents which were considered by that Court, and were not uses of the *complete* apparatus of the claims, nor of parts

having the same peculiar structural features of some of the parts shown in the patent in suit. It is true that the Court of Appeals for the Third Circuit referred to the record in the Sixth Circuit as a "meagre record" and expressed the belief that the patent would have been granted had the evidence in the present record been before the patent authorities, but the Court does not point out and does not find that any new element has been proved as part of the prior art, as distinguished from more detailed proof and proof of actual use of the same elements.

The conflict therefore appears to be one of decisions based upon substantially the same facts, or at least facts which have substantially the same relation to the questions decided. A reading of the last paragraph but one of the opinion of the Circuit Court of Appeals for the Third Circuit, and a comparison of the summary of parts found in the prior art with claim 5 of the patent will show that two elements at least were lacking, viz.: the "boom carrying the conduit" or so-called "boom spout," and the vertical adjustability of the boom and bin or "means for receiving plastic material." These two elements being absent, the *combination* cannot be present in the prior art.

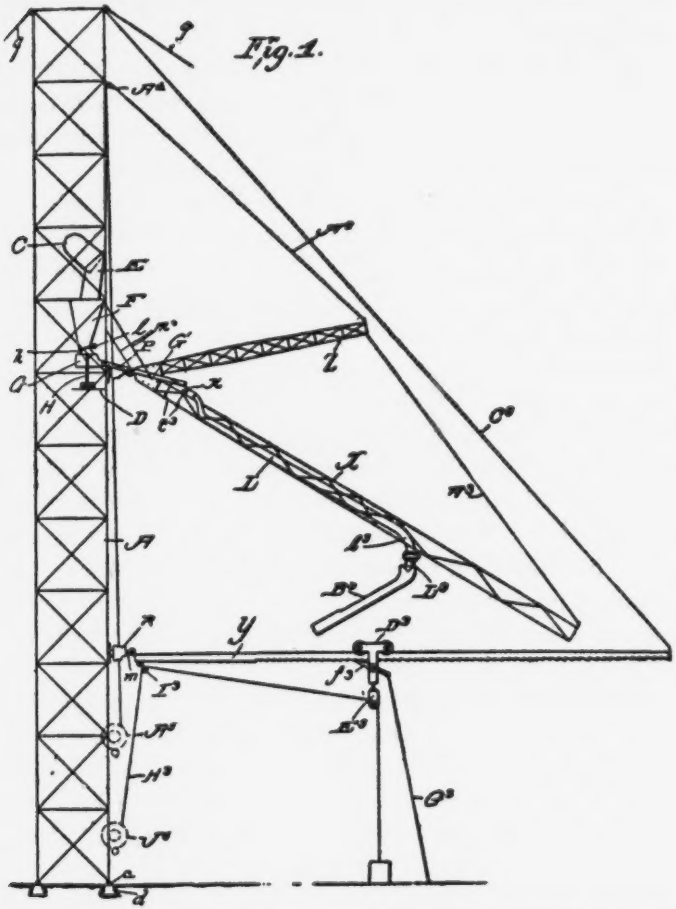
THE SUBJECT MATTER OF THE PATENT.

The subject matter of the Callahan patent in suit No. 948,719 (R. 634-5) is a *contractor's plant*, what is commonly known as a gravity concrete distributing plant or spouting plant, and such plants are very extensively used in the construction of buildings throughout the United States. The object is to enable the builder to bring all his concrete making materials to one point on the job, mix them there and then, by means of this gravity distributing plant, to elevate them and chute them to any and all points

throughout the entire growing structure, and without reconstructing or rearranging the various parts of the plant, so that once the concrete distributing plant is set up it will remain substantially intact and supply all parts of the building. When the building is completed the concrete distributing plant is taken down and removed and may be set up and used in the same manner on another job, and so on. The construction and arrangement is such that the plant may be used on *any and all ordinary buildings*, and under any and all conditions *without alteration*. In other words, the plant covered by the patent is in effect *a contractor's tool or implement, universally usable on all usual building constructions*. It may also be used without alteration in the construction of walls, bridges, viaducts and other works.

It comprises a tower in which the concrete is elevated to the proper height, as the building rises, a vertically adjustable receptacle on the tower which also rises, with the building, and conduits or "spouting" provided with a swinging and vertically adjustable boom, or its equivalent, and enables the builder to distribute concrete to all parts of the building laterally and vertically, without rebuilding or rearranging the distributing plant. These plants are a familiar sight in every section of the country.

The following cut, which is a reproduction of Fig. 1 of the patent (R. V. III, p. 128), shows diagrammatically an embodiment of the improvement:



In this illustration, *A* is a skeleton tower, which may be erected to the height of the building in the first instance or extended upward as the building rises by simply adding the interchangeable duplicate sections at the top of those originally placed.

C represents a common form of hoisting bucket, arranged to be raised to any desired point in the tower and to automatically dump the concrete—which is mixed at the base of the tower—into a hopper or receptacle represented at *F*.

G is a pan, bin or "receptacle" which receives and holds the mixed concrete, and from which the concrete is fed as desired, by means of a suitable gate, to the conduits chutes or spouts extending to all parts of the building.

The hopper *F* and pan *G* constitute the "receptacle" for the material of the claims, and are mounted in the tower in such a manner that they may be moved upwardly therein as the building rises, so that they will always be elevated above the level of the concrete work and give the concrete a proper head so that it will flow by gravity to the points of application.

L is the conduit chute or spout through which the concrete flows from the adjustable receptacle in the tower to any and all parts of the building. In the illustration it consists of a pipe or conduit carried by a long arm or "boom" consisting of bars or rods and truss work. The conduit proper is inside this boom and connected therewith so that the two form in effect a unitary structure. The boom or arm is represented at *X*.

The combined boom and conduit or "boom spout" is also vertically adjustable on the tower, so that, like the receptacle it can be raised higher and higher as the building grows. It is also mounted so that it can be swung sidewise through the greater part of a circle, and also so that it can be swung up or down.

The chute or conduit *L* has a swiveled end section B^3 jointed thereto, and there may be as many of the sections *L* as the lateral dimensions of the building require. The boom chutes are commonly made 48 feet in length, and it will be seen that not more than two or three of them will be needed to provide a radius sufficient to cover any ordinary building area.

The claim of the patent taken by the Court of Appeals for the Sixth Circuit as a typical definition of the improvements is claim 5, which reads:

> "5. An apparatus for the purpose described, comprising a tower, a conduit, extending laterally therefrom, a suitably-supported, horizontally-movable *boom carrying the conduit;* said boom being *adjustably* connected with the tower and adapted to be arranged *at various points in the height thereof,* means for raising plastic material to the point desired in the height of the conduit, and means for receiving plastic material from the raising means and conducting the same to the conduit; the said receiving and conducting means being *adjustable in the direction of the height of the tower.*"

It will be seen that this claim is for an apparatus consisting of a combination of the following parts or elements.

1. A tower,
2. a conduit extending laterally therefrom,
3. a suitably supported horizontally-movable boom *carrying the conduit;* said boom being *adjustably connected* with the tower and adapted to be arranged *at various points in the height thereof,*
4. means for raising plastic material to the point desired in the height of the conduit (tower),
5. means for receiving plastic material from the raising means and conducting it to the conduit; said receiving and conducting means being *adjustable in the direction of the height of the tower.*

In other words, it calls for an apparatus consisting of (1) a tower, (2) a conduit, (3) a swinging and vertically

adjustable boom carrying the conduit, (4) a hoisting bucket or the like, and (5) a vertically movable bin or receptacle communicating with the conduit.

The details of the illustrative embodiment of the improvement claimed are fully described and shown in the specifications of the patent, and need not be here described at length. The patent is not limited to such details of construction (Pat. p. 3, lines 69 to 77).

RESPONDENTS' APPARATUS.

First Structure:

Prior to the filing of the bill of complaint, respondents were using the apparatus shown in petitioners' exhibits *F*, *G* and *H*.

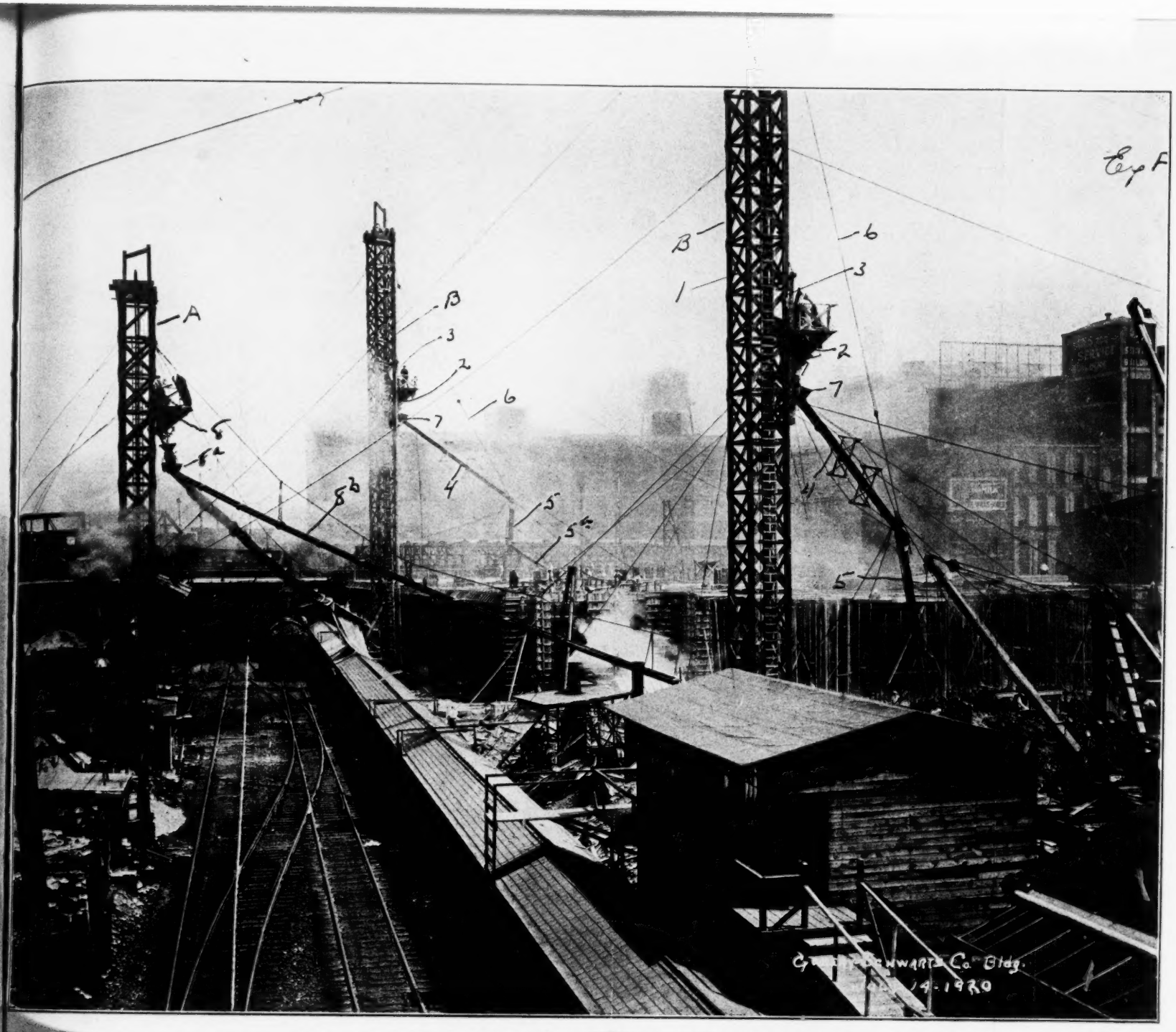
Referring to exhibit *F* (printed herewith and designated "Defendants' Apparatus Before Bill of Complaint") it will be noted that this apparatus comprises the following mechanism:

Closely adjacent to the building site, at two points, is a tower *B*.

Vertically adjustable on each of these towers, is a hopper 2 to the discharge end of which is swiveled at 7, a boom-chute member 4, corresponding to the similar member composed of *L* and *X* of the patent, the outer end of which is suspended, from the upper end of the tower by the suspension line 6. Swiveled to the outer end of the element 4 is the upper end of an extension chute 5.

Within the tower is an ordinary hoisting bucket of the automatic dumping type and capable of properly elevating the concrete.

The vertical adjustment of the hopper is facilitated by a vertically adjustable carriage 3 slidably mounted on the face of the tower and carrying the hopper 2. The inner end of the boom-chute element 4 being swiveled to the



DEFENDANTS' APPARATUS
BEFORE
BILL OF COMPLAINT

hopper, the vertical adjustment of the hopper is accompanied by the vertical adjustment of the inner end of element 4.

The element is a *composite* boom-chute element having chute functions and boom functions, and is the full mechanical and functional equivalent of the members *X* and *L* of the Callahan patent.

The operation of respondents' apparatus was as follows:

The hoisting bucket being lowered to a point near the foot of the tower, was filled with concrete and hoisted to hopper 2 into which its load was automatically dumped. The concrete flowed from hopper 2 through the element 4 and chute 5 and was discharged from the lower end of this chute to the desired point of deposit anywhere within a semi-circular area having a radius equal to the combined lengths of the two elements 4 and 5.

It will be noted that the two elements 4 and 5 were supported from the tower in co-operative relationship with the hopper, also supported by the tower, and that the area of concrete deposit-effectiveness of the apparatus was entirely free from obstruction by any necessary supporting trestles or other elements to be supported on the form work into which the concrete was to be deposited.

Respondents' building operations, as will be noted from Exhibit *F*, were closely alongside railroad tracks and there was not sufficient room between the building site and the railroad tracks for storage of sand, gravel, cement, etc., required for the production of the fresh concrete mixture. It was necessary, therefore, for this mixture to be produced upon the opposite side of the railroad tracks.

Respondents, therefore, provided the tower *A* equipped with hoisting mechanism and a hopper 8. Extending from tower *A* to each tower *B* was a fixed suspension cable from which were suspended the two chute lines, 8b and 8c, the

receiving ends of which were in position to receive the discharge from hopper 8 and the discharge ends of which were supported respectively in position to discharge into the hoisting buckets of the towers *B, B,* when said buckets were in their lowest position.

The chutes 8b and 8c, and their suspension lines were fixtures throughout the entire building operation, the discharge points for these chutes remaining the same at all times. Consequently there was no variation in the vertical location of the hopper 8 during the building operation.

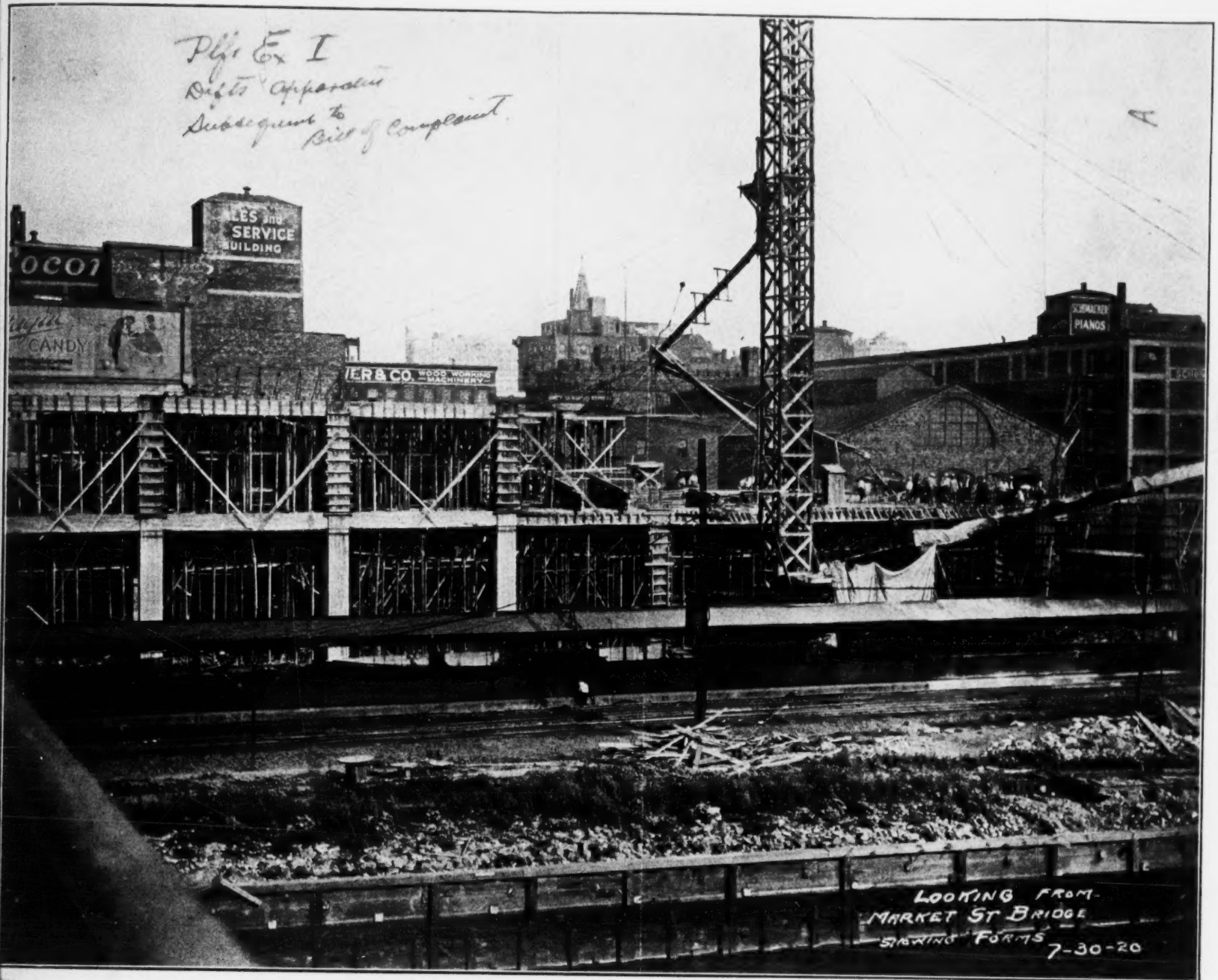
The use of the apparatus shown in this Exhibit *F,* as well as that shown in Exhibits *G* and *H,* is admitted in the answer (par. 1, R. 9), which exhibits are offered at R. p. 111. The use of the other apparatus, shown in Exhibits *I, J, K, L and M,* is also admitted (R. 111).

Because of the immobility of the apparatus comprising the tower *A,* hopper 8, chutes 8b, 8c, and lack of any boom construction petitioners did not include such apparatus in its claim against the respondents in the present case.

Second Structure:

After the filing of the bill of complaint, but before the hearing on motion for preliminary injunction, respondents modified the tower *B* structures, of their exhibits *F, G* and H, as illustrated in petitioners' exhibits *I, J, K, L, and M,* exhibit *I* of which is reproduced herewith and designated "Defendants' Apparatus After Bill of Complaint." It was agreed by both parties that this modified structure should be considered as though it had been put into use prior to the filing of the bill of complaint.

The sketch marked "Fig. 7" (*infra*) illustrates this modification. Here the tower *A,* hopper F, boom-chute *L-X* and suspension member A^3 are exactly the same as in the earlier structure.



DEFENDANTS' APPARATUS
AFTER
BILL OF COMPLAINT

The second chute B^3, however, was of the counterbalanced type, as illustrated in Fig. 7, where the chute B^3, suspended by a gimble joint from the lower end of the chute *L*, is provided with a counterbalancing truss *V* so that its lower end needs no external support. It was found that the boom-chute structure *L-X* was not sufficiently strong, to carry the added weight of the counterbalance, and consequently the additional boom-arm *X'* was introduced, its lower end being supported by pivot *m'* on the tower.

It will therefore be seen that both of respondents' structures complained of embody the improvements defined in the patent in suit and structural features which are mechanical equivalents of those shown and described in the patent and fully comprehended within the meaning of the claims.

The Errors Assigned.

The errors here assigned may be summarized as follows:

1. That the Circuit Court of Appeals for the Third Circuit erred in assuming that all the elements of the patented improvements are found in the prior apparatus in substantially the same form and relation, and performing the same functions, whereas the structural differences between the combinations of the prior art and the parts thereof and their failure to provide the constructor's plant of the patent or perform its functions is apparent.

2. That the Circuit Court of Appeals for the Third Circuit erred in not holding with the Circuit Court of Appeals for the Sixth Circuit that whereas the elements of the patent are found in the prior art, in substance or

in form, and some of them were combined in apparatus, the improvements of the patent are a true combination securing a cooperative and unitary result and producing a unitary structure not anticipated in form or in substance by the prior art.

ARGUMENT.

I.

There is no serious question of infringement. The apparatus of the patent and respondents' apparatus are substantially the same in structure and in result.

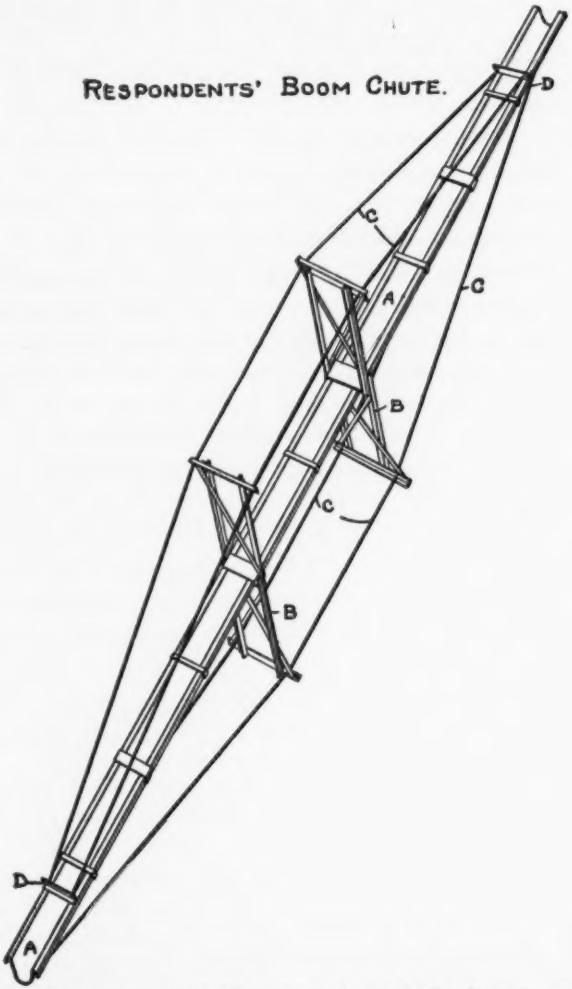
It will be apparent from the foregoing that the respondents' apparatus contains all the elements of the patent in suit in substantially the same form, in the same relation to one another, and performing the same functions.

Reading claim 5 of the patent in suit on the respondents' apparatus as shown in Exhibit F and inserting the reference characters of the Exhibit we have the following:

> An apparatus for the purpose described, comprising a tower (*B*), a conduit (4) extending laterally therefrom, a suitably-supported horizontally movable boom (see supporting frames and rods on 4) carrying the conduit; said boom being adjustably connected (at 7) with the tower and adapted to be arranged at various points in the height thereof (with hopper 2), means for raising plastic material to the point desired in the height of the conduit [tower] (the hoisting bucket), and means for receiving plastic material (hopper 2) from the raising means and conducting the same to the conduit; the said receiving and conducting means (2) being adjustable in the direction of the height of the tower.

This construction and operation of the respondents' apparatus is not questioned.

The only difference between the structure of the patent and the respondents' structure is in the boom-chute, which in the patent consists of two distinct parts or members united by having the chute run through the inside of the boom, and in the respondents' structure consists of these two parts united to form a single structure. As will be seen at 4, in Exhibit F, respondents' boom consists of truss work—as in the patent—through which the spout extends—as in the patent—but instead of having the truss work self-supporting, as in the patent, respondents' truss work is secured to the chute, so that a part of the chute forms in effect a part of the boom. The following illustration marked "Respondents' Boom-Chute" shows the details of construction.



The chute proper is the part *A*, and the boom portion consists of the frames *B* and connecting rods or wires *C* running through the frames and having their ends connected to the chute proper at *D*. It will be apparent that if the boom structure were removed from the chute it

would not be self-supporting. However, to run rigid rods from end to end of the boom structure so as to support and stretch the rods *C*, instead of having them stretched and supported by the chute would be an equivalent construction. Likewise to connect the truss rods of the boom of the patent with the chute *L* instead of connecting them with the rods running parallel with the chute would produce an entirely equivalent structure.

Obviously the chute could be outside the boom and connected therewith rigidly or flexibly and the boom could be either parallel with it or disposed at an angle thereto, without departing from the scope of the improvement, which contemplates merely in effect a chute and a boom supporting it, the two parts being so combined or connected as to act and move in unison, so that the chute part is supported and strengthened by the boom part and is thereby enabled to support extension chutes to increase the radius of gravity distribution.

As previously stated, respondents have two forms of apparatus which are complained of in the present case, the first having been in use at the time the bill of complaint was filed, and the second having been put into use subsequent to the filing of the bill of complaint but prior to the hearing on motion for preliminary injunction.

By agreement of the parties, both of these forms are to be considered.

The first of these forms is illustrated in the inserted Fig. 6 (*infra*).

This apparatus comprised a tower *A*, a hoisting bucket *C*, a hopper *F* vertically adjustable on the tower, a trussed-boom-chute element *L-X* pivotally suspended at *O*, at its inner end, from the hopper *F* and supported at its outer end by the suspension member A^2 from the tower at the point *R*. A second chute section B^3 was suspended from the outer end of the first chute member by a swiveling element.

The suspension point *O* was vertically adjustable on the tower and consequently the chutes *L* and B^3 were vertically adjustable on the tower.

It is immaterial whether the boom-chute element *L-X* is suspended from the hopper by the member *O* or pivoted directly upon the tower upon the vertically adjustable member *m* as shown in the sketch.

The boom-chute element *L-X* comprises a longitudinally medial sheet iron chute or trough *L* stiffened, to resist compressive and buckling stresses, by means of a pair of transverse frames or struts *YY* and four tension rods *W* passed over the corners of the transverse struts *Y* and secured at their ends to the ends of the chute *L*. This was the common form of boom construction except that in the common form, the longitudinally medial member *L* would commonly be a solid element or a latticed element instead of a chute or trough.

In this construction the hopper, "boom" and chutes were vertically adjustable on the tower; the tower was increased in height from time to time as the building progressed; the concrete was hoisted in the bucket *C* and delivered to the hopper *F*, in whatever position it might lie; the concrete was delivered from the hopper to the inner end of the chute *L* and flowed through this chute to the chute B^3 and, flowing through this chute, was delivered from the outer end of chute B^3 to any desired point in the various floor levels, the two chute sections being supported from the tower and capable of being swung about their respective pivotal connections in such manner that the delivery end of the second chute could be brought to successive positions throughout its horizontal areas.

The second form is illustrated by Fig. 7 (*supra*).

Here the parts *A*, *C*, *F*, *O*, *L-X* (including *Y* and *W*), A^2, *R*, and B^3 were retained.

BLUEPRINT
TOO
LARGE
FOR
FILMING

It was desired, however, that a third chute section B^4 be connected to and partially supported by the second chute section B^3 and for that purpose there was associated, with the chute section B^3, a counter-balancing truss T. It was found, however, that the additional weight of the counter-balancing truss was too great to be borne by the boom-chute combination L-W-A^2 and consequently there was added a second boom arm X^1 pivoted, at its inner end, to a pivotal support m^1 on the tower, and connected at its outer end to the outer end of the boom-chute element L-X, the pivotal support m^1 being vertically adjustable on the tower.

In this form, therefore, we have not only the boom-chute construction of the first form, but also a separate and distinct boom "carrying the conduit," as the claims express it.

In the accompanying six sketches, Fig. 1 is a reproduction of the pertinent portions of Fig. 1 of the patent differing therefrom merely in minor and unessential details. That is to say, we have here the tower A, the hopper F, the hoisting bucket C, the "boom" X, the strut Z, the suspension lines A^2-A^3, the conduit L, and the second conduit B^3. The "boom" X is pivoted upon the tower at m.

In the patent, the conduit L is encased within the latticed "boom" X whereas in Fig. 1, under discussion, the conduit or chute L is laid along upon the top of the element X in order that it may be more clearly distinguished. In Fig. 1 under discussion, also, we have omitted the intermediate pan G and spout G_1 of the patent because the inner end of the conduit L is brought into position to receive the concrete direct from the hopper, and the inner end of the conduit L is directly swiveled to the hopper. Such changes, however, are of the kind which would be ordinarily made in the commercial development of the invention and do not in any way alter the cooperative relations or functions of the several elements.

In this construction the "boom" of claim 5 is composed of the elements *X*, *Z*, A^1 and A^2 because, clearly, the element X by itself, and without the suspension member A^1, A^2, would be incapable of performing the function for which it was designed in the specified combination, *i. e.*, the SUPPORT OF THE CONDUIT FROM THE TOWER and independent of any external support.

Here, unquestionably, the conduit is carried by the boom and there is a "boom carrying the conduit."

In this case, the conduit, being supported by the boom element *X* throughout its entire length, may be of comparatively light material and it may or may not be physically connected to the boom element *X* in such way as to contribute its strength to the boom element *X* in such manner as to stiffen it. The boom element *X*, however, stiffens the conduit throughout its entire length and enables it to perform its function as a conduit for the mush concrete.

Turning now to Fig. 2 we find the same construction and arrangement of elements illustrated by Fig. 1, excepting only that the strut *Z* has been dispensed with and a single suspension member A^2 serves to support the outer end of the boom element *X* from the tower and, in turn, the receiving end of the second chute element B^2 is supported, from the tower by the boom composed of the "boom" element *X* and the suspension member A^2.

Clearly the construction shown in Fig. 2 is the mechanical equivalent of the construction shown in Fig. 1, and is, therefore, within the terms of claim 5.

In Fig. 3 the individual elements are identical with those shown in Fig. 2 and identical with the corresponding elements shown in Fig. 1. The only difference is that the boom element *X*, instead of being downwardly inclined, at the same angle of inclination as the chute, is upwardly inclined. In order, therefore, that the chute may be car-

ried by the boom, *i. e.*, supported by the boom in position to permit the concrete to flow through it, a supplemental suspension member A^3 is provided between the outer upper end of the boom element *X* and the outer lower end of the chute *L*, and a connection *U* is provided between the boom element *X* and the chute element *L* at the point of intersection of the two elements.

In this arrangement the chute is only supported at its ends and at its middle. Naturally, under such circumstances, the chute would have to be somewhat stiffer than the chute in the forms shown in Figs. 1 and 2 but only the skill of a mechanic would be required to provide the additional stiffness and this stiffness might be obtained either by using heavier material for the chute itself or by providing a brace either in the form of a truss or by supplemental compression members.

There could be no possible doubt that the construction shown in Fig. 3 is the full equivalent of the constructions shown in Figs. 1 and 2. In fact, they are identical, so far as structural elements and cooperative functions are concerned. There is in this construction, unquestionably, a "boom carrying the conduit."

In the construction shown in Fig. 4, the boom element *X* is upwardly inclined, as in Fig. 3, but is dropped down somewhat lower on the tower so that its point of intersection with the downwardly inclined conduit *L* is at the outer end of the conduit so that a single suspension member A^3 is all that is necessary. In this construction, as in Fig. 3, the upper receiving end of the conduit is suspended from the hopper and, as it is unsupported except at its ends, it would, of necessity, have to be either of heavier material than the conduits in the preceding figures, or would have to be trussed or braced in some manner. Such increase of strength, however, would not in any way alter its function as a conduit and, clearly, it is "carried by" the

boom (elements X and A^2), because any horizontal swinging of this boom necessarily produces horizontal swinging of the conduit. It will also be noted that at least half of the weight of the conduit is directly supported and carried by the boom X-A^2 and, the weight of the second conduit section B^3, or at least half of it, is also carried by the boom X-A^2.

Clearly then the construction shown in Fig. 4 is the same, as to elements and their cooperative relationship as in Fig. 3 or Figs. 1 and 2.

In Fig. 5 we find the same tower, bucket, hopper and conduit as in the preceding figures.

Instead of the plain latticed boom element X found in the preceding figures, however, there is a boom element X which is composed of a central, or longitudinal medial strut X, a pair of transverse struts YY, and tension members W, this whole boom element being pivoted at m on the tower and supported at its outer end by the suspension member A^2.

Resting upon this trussed boom element (composed of the members X, Y and W) is the conduit L which, being supported through a major portion of its length may be somewhat less strong than in the arrangements shown in Figs. 3 and 4.

Unquestionably we have here a "boom carrying the conduit" exactly as in the preceding figures. The change in the form of the boom element X does not alter the combination or vary the cooperative relationship.

These diagrams show that each of the structures illustrated is a combination of five elements; that each of these elements has its counterpart in each of the six structures; that the same combination of five elements exists in each of the structures; that each structure is, both structurally and functionally, the equal and equivalent of each of the others.

When the structurally and functionally different apparatus of the prior art, which respondents contend anticipate the improvements of the patent, are considered, it will be apparent that there is really no issue of infringement here because the apparatus of the patent and respondents' apparatus stand alone and together in a position quite removed from these other devices.

Taking another view of the matter, and referring again to the illustration "Respondents' Boom-Chute," it would make no substantial difference in the construction or operation if the portions of the chute to which the boom parts are connected were severed from the chute proper, thus leaving two distinct elements; and clearly in this case there would be the chute or conduit and the boom supporting it as separate entities.

If the patent is valid it must cover such obvious variations in the details of construction. There is nothing in the specification to limit the claims to a separate and distinct boom and conduit, and the specification concludes with the statement that "it is obvious that in the future practice of my invention various changes in the form, construction and relative arrangement of parts may be made within the scope of my invention as defined in the claims appended (Spec. p. 3, lines 72-77).

It is well settled, and by many authorities, that *to unite two elements* no more avoids infringements than to divide them and make of one element two separate parts.

> *Capital* v. *National*, 70 Fed. 709.
> *Standard* v. *Caster Co.*, 113 Fed. 162-169.
> *International* v. *Brammer*, 138 Fed. 396.

> "Infringement is not avoided by eliminating a separate element of a patented combination, where its function is transferred to one of the remaining elements by adding thereto an integral part spe-

cially designed to perform the function of the omitted element in substantially the same way."

Brown & Sharpe v. *Starrett*, 225 Fed. 997.

The principle that the absence from an alleged infringing device of one of the elements of a patented combination covering the same, is fatal to the claim of infringement, is qualified by the principle that the absent element must be an essential one, and that a substitute for it must not be its mechanical equivalent (*Dowagiac* v. *Minnesota*, 118 Fed. 136).

Even if the claims were strictly interpreted, the expression of claim 5 *"horizontally-movable boom carrying the conduit"* would be sufficient to include such a device as respondents'. Under this expression, the conduit may be made a part of the boom or separate and distinct therefrom. But the patent is not for details of construction, but for *a contractor's plant* comprising certain assembled parts forming a unitary structure, and must be so considered in connection with the questions of infringement and validity.

II.

The date of invention of substantially the apparatus of the patent, by Callahan, the patentee, is not later than January, 1908, and nothing done by others subsequent to that date can be considered as part of the prior art.

The application, upon which the patent in suit was issued, was filed January 21, 1909, but the record shows that Callahan conceived, disclosed, and reduced his invention to practice, a little more than a year prior to that date.

As early as 1901 (Q64, R. 77) Callahan was a small con-

tractor of very limited means, who had some experience in the handling of concrete, especially in the building of foundations, and he conceived, at that time, the idea, which was new to him, that freshly mixed concrete could be more efficiently handled if, instead of being mixed in a comparatively dry mixture, it were mixed "soupy enough or of a plastic consistency" so that it could be delivered to desired points through troughs or chutes, and he thus constructed a number of foundations with very satisfactory results.

In the latter part of November, 1907, Callahan went to Los Angeles, California, and looked about for a job. He saw, under construction, a reinforced concrete building, the Majestic Theatre (Q4, R. 68), and sought employment from the contractor. He interviewed Mr. Hugh W. Bryson, now deceased, and outlined to Mr. Bryson his ideas of handling concrete in the further construction of that building.

Bryson was the manager of the F. O. Engstrum Company, the contractors building the Majestic Theatre, and, of course, that organization was a going concern. Quite naturally, therefore, the employment of the unknown Callahan was in a subordinate position.

Petitioners make a great point of the subordinate character of Callahan's employment but this fact is wholly immaterial, as we shall point out at a later point in this brief.

In these early conferences with Bryson, Callahan clearly disclosed (Qs4 and 5) the particular combination defined by the claims in suit, comprising the tower which was to grow in height as the building progressed; the hoisting bucket in the tower; the mixer at the base of the tower; the vertically adjustable hopper; the chute; the swinging boom supporting the chute; and the distributing pipe at

the end of the chute carried by the boom, *these last three elements to be wholly supported by the tower and vertically adjusted from time to time as building operations progressed.*

Bryson corroborates this disclosure (XQs53-57, R. 433-434).

Bryson was called as petitioners' witness and on direct examination he was asked the following questions (R. 427-30):

> "Q13. Prior to January, 1908, do you recall talking with Emtman or *anyone* else as to the apparatus that should be used in handling the cement or mush by the gravity system * * *.
>
> "Q24. Was the rotatable mast used in connection with the cement work of the Majestic Theatre? A. Well, you might term it that. It was a boom. Part of it was a boom; afterwards it developed into a more perfected boom. My recollection was a stick about 20 or 25 feet long that was so constructed that it could vertically move with the pipe quite a degree away from the tower swinging movement and the pipe was hung from a guy wire from tower, which gave it that oscillating movement. A very crude method of what has now developed into the gravity system and particular feature of it was developed by Mr. Callahan on that particular job. That is, it was under his supervision. He was under the working foreman on a job. It was explained to me he had had some previous experience on gravity system and was allowed to put one up there. That was in 1907 about the latter part and the first part of January, 1908, and it was continuously used and improved as we went along. We first started with a 4-inch pipe and they found that clogged; then we got a 6-inch pipe and found that clogged; then we got an 8-inch pipe all with this little boom or pole or little arm and pipe suspended from tower by cable and swivels so as to get an

> oscillating vertical movement. That was very crude compared with drawings that came after, so far as a whole gravity system was concerned, which had to be developed from different angles, so we could use it from a practical standpoint."

It will be noticed that question 13 was not limited to an inquiry as to conferences with Emtman but with "anyone else" thus clearly including Callahan if the conversations were had between Bryson and Callahan. It will also be noted that the witness directly referred to Callahan in his answer to Q24, and that such reference to Callahan was not in any way volunteered but was in a proper way responsive to Q24.

The cross examination of Bryson which developed Bryson's conferences with Callahan, was entirely proper.

It should be noted, also, that the redirect examination of this witness (R. 443) directly referred to this subject matter and made the witness respondents' witness on this point.

Again, Bryson (Qs33-34, R. 431) was asked on direct whether or not gravity distribution of concrete "in any way—new or old—was done on that job [the Majestic Theatre] prior to January 1, 1908" and his reply, in part, was

> "It might have been put in by gravity in the basement, but when it comes to using the boom and the swivel and the pipe suspended from the tower that has a vertical [horizontal XQ69] movement about the mixer, that is the first place we used it—on the Majestic Theatre—that is gravity system also,"

and that this was "about the last of December, 1907, or the early part of January, 1908" (Q35). Surely petitioners had the right, by way of cross examination, to develop all the facts relative to the structure referred to in these

entries, and the cross examination developed the fact that Callahan was responsible for the production of this apparatus.

Whether Bryson, on this point, was respondents' witness or petitioners' witness, his testimony fully corroborates Callahan as to the disclosure by Callahan of the invention in issue, during the early conferences, in November and December, 1907, which led up to Callahan's employment on the Majestic Theatre job.

Callahan went to work on this job the day after Christmas, 1907. He was not sure as to whether the tower and hoisting apparatus was in position at that time.

But it may be assumed that there was already in place a tower, hoisting bucket and hopper, and mixer at the bottom of the tower, because that sort of an apparatus was in common use at that time, the concrete, in a comparatively dry mix, being delivered from the hopper to wheelbarrows and by them distributed throughout the desired floor levels.

Callahan began immediately to put his ideas into practice. He had a pit dug on the south side of the building about half-way back and erected the tower in the pit so that the bucket could come low enough to receive material readily from the mixer (R. 69, Q9); equipped the tower with *a hopper;* had some galvanized iron pipe made, preparing some rough sketches which were not saved; arranged the hopper at a considerable height above the level of the point of deposit (R. 70, Q10); prepared *a receiving pan* to bridge the gap between the hopper and the inner end of the pipe, swiveled a *"boom pole"* on the tower (Q11); supported the outer end of this boom pole by block and tackle from the tower, *thus making a swinging boom entirely supported by the tower,* and serving as a support to carry *the chute.* He also provided a gate in the hopper so that the concrete could be controlled in its bow from the hopper to the pipe (Q12).

At the outer end of the boom supported pipe, there was an eighth bend which delivered to a swiveled "receiving pan" (Q5).

This apparatus was put into use about the first of January, 1908 (Callahan Q13). The first pipe was only four inches in diameter and was found to be too small, whereupon pipes of successively larger sizes were tried within the course of a few days until a pipe about *seven inches* in diameter was tried and found to be *entirely satisfactory.*

At this time the work had reached the second story level and consequently Callahan carried his tower up much higher than the common practice of that time would require in order that he could raise his hopper high enough to get the necessary gravity flow. As the work progressed the height of the tower was increased and the hopper, the boom apparatus, chute, etc., *were raised from time to time as the work progressed.* All of the concrete from the second floor up *to the roof slab above the eighth floor* was handled by this apparatus and the operation was entirely successful.

So far as Callahan knew, the thought of mixing a concrete mixture very wet so that it would *readily* flow through the chutes, was original with him. This record shows, however, that this was a matter which had reached the minds of many in various parts of the country, prior to Callahan's activities at Los Angeles, but that fact in no way detracts from the value of the *apparatus* which Callahan provided for handling such concrete, and all that respondents say about the controversies, among engineers, as to the propriety of using a wet mix or a dry mix is, we think, wholly beside the point.

Callahan is thoroughly corroborated as to the character of the apparatus which he installed on the Majestic Theatre job and as to the time when it was installed. Bryson

testifies definitely and positively that Callahan had charge of the development of this particular apparatus on the Majestic Theatre job under instructions from Bryson (XQ65, R. 435; RdQ160, 167 to 176, R. 445-7). Bryson also says that prior to Callahan's disclosure and development Emtman had never described to him any apparatus approaching the Majestic Theatre apparatus (XQ98a, etc., R. 438).

No drawings were made of this apparatus and the few sketches which Callahan made were not preserved. This is not at all surprising because a skilled mechanic like Callahan would have no difficulty at all in building an apparatus of the kind without the use of drawings.

Respondents' witness, Parker, was the engineer, under the architect, in charge of the Majestic Theatre job and he took some progress photographs of the work (Defendants' Exhibit 44).

Respondents dwell upon the fact that no one of these photographs shows the tower, hopper and boom, and that no photographs were taken by Callahan. These facts, however, do not justify their assertion that the Parker phtotgraphs are not corroborative of the Callahan testimony. Parker was interested in the progress and completion of the building no matter what apparatus was used. Callahan was a poor workman who can hardly be chargeable with the duty of obtaining a camera and making photographs. The Engstrum Company was interested in building progress and would have no difficulty in reproducing any particular piece of apparatus and, of course, this particular apparatus at that time was rather crude.

Parker says that Exhibit 44D shows a tower (Q189, R. 449); that other photographs were taken but that he is unable to find them (XQs194-5, R. 450).

He says also that

> "The concrete is [was] dumped from the mixer into a concrete hoist, which runs up the tower to hopper and then from the hopper into a receiving chamber or device, that in turn, spouts it into the pipe." (XQ198, R. 450).

The tower was carried up higher than the common practice and the hopper set "very much higher than was usual for the wheelbarrow method." (XQ205, R. 451.) Parker, referring to the pipe, says that

> "At the tower it was supported by their block and tackle and rope they used to pull lumber up * * *." (XQ201.)

There was a pan-like affair, the details of which were not clearly remembered (XQ211) which delivered from the hopper to the boom supported pipe.

Parker was not very clear as to just how the pipe was supported but he says:

> "It was all open space out in front of tower to balcony, and in coming that far it would be supported by maybe one or two [guy wires from the tower] I don't really remember." (XQ214.)

The first pipe used was too small (XQ218) but the substituted larger pipe was all right (XQ219).

Parker recalls that at times it was necessary for a man to "*climb out on the pipe to knock the concrete loose*" and that a brace pivoted to the tower and suspended at its outer end by a guy wire from the top of the tower "was the only means by which it [the long span of pipe] could be supported." (QX223.)

Parker remembers Callahan as one of the "straw bosses" on the job and that while Emtman was superintendent of the job, he (Emtman) was down there on the

work only "off and on until later when they put him on another job where he was in charge continuously." (Q187.)

Respondents say that Emtman was naturally the man to suggest the apparatus under discussion, but at no point in his deposition does Emtman make such a claim and he says that he was *only on the job occasionally* (Emtman Qs56-72, R. 507).

Parker recalls that prior to the installation of this apparatus the concrete was a mixture which had to be tamped or puddled (XQ235, R. 455) and delivered by wheelbarrows but that when this apparatus was installed a wetter mixture was used which at first excited his fears, but he found that the apparatus worked very much beyond his expectations (XQ226).

About a week before Christmas, 1907, somebody connected with the Engstrum organization conferred with Parker to obtain his consent to the use of a wetter mixture RXQs255-7, R. 457), and he is confident that there was no use of a gravity system before Christmas (RXQ259), but that the gravity apparatus was installed either the last week in 1907 or the first week in 1908 (RXQ261). He does not recall any specific instructions relative to this apparatus, from Mr. Emtman.

While there is nothing in the Parker deposition which directly connects Callahan with the developments at the Majestic job yet, nevertheless, the Parker testimony corroborates Callahan and Bryson because he recalls that Callahan was on the job, recalls, in a general way, the character of the apparatus, and the time when it was installed, and his recollection on these points fits in with the testimony of Callahan and Bryson on the same points.

In open court Frederick E. Engstrum, vice-president, secretary and treasurer of petitioner, Concrete Appliances

Company, testified that the apparatus used in fabricating the Majestic Theatre after it had progressed part way comprised a tower, hopper, hoist and boom supported pipe, the tower being some fifteen feet from the south side at the center of the building.

> "The first section of the chute was supported at the intake below the hopper with a—I don't know what material—either a wire or a cable, and by cables or wire under the boom." (Q16, R. 589.)

He further testified that this apparatus was installed early in 1908 *and that Lee Callahan was the designer and originator.*

To offset this positive testimony as to the existence and character of the apparatus on the Majestic Theatre job, respondents offer the *negative* testimony of several witnesses.

Emtman, a rival patentee to whom we shall refer later, contented himself, by replying, to many leading questions, "I do not remember." Nowhere in his deposition does he assert that he had anything whatever to do with the particular apparatus under discussion at the Majestic Theatre. While he was general superintendent for the Engstrum Company, he only saw the progress of the Majestic job "part of the time" (Q18, R. 502), and does not remember ever having given any directions or advice as to the Majestic job.

He says, however, that an apparatus like that shown in the Callahan patent, Fig. 1, was used in connection with the construction of the Majestic Theatre Building (Qs55-57, R. 506); that he was only there two or three times (Q58); and that he didn't have anything to do with ordering or designing that apparatus because he was "elsewhere" (Q61) and was on "some other job" (Q62).

There is nothing in the Emtman testimony to tend, even by the "shade of a shadow" to prove that Emtman was the inventor of the Majestic apparatus, or to disprove that Callahan was the inventor. It does prove, however, that on that apparatus there was a tower, hoisting bucket, hopper and distributing pipe (Q57).

The *ex parte* affidavit of Emtman in the Interference proceedings is not proof or disproof.

Respondents' witness Blake stated that he saw the Majestic Theatre building under process of fabrication in February or March, 1908 (Q14, R. 405) and saw the Timken building in San Diego, to which reference will be made later, in the summer of 1908, and he states that he *did not remember* having seen anything in connection with either building in the nature of a concrete distributing apparatus different from what was customarily used at that period (Q15).

Blake was not interested, at the time of his visit to the Majestic Building, in special apparatus and did not pay any particular attention to it. At the time of that visit he was seeking information as to "time of delivery of materials, means of securing materials, labor and general working construction conditions, in and around Los Angeles" (XQs88-89, R. 412).

He did not go above the ground floor and there is nothing to indicate that he made any examination of the exterior of the building.

Respondents urge strongly that there was some sort of special concrete handling apparatus on the Majestic job and that Emtman was responsible for it, yet in the same breath they urge that Blake, because he says he *didn't see* any special apparatus on the Majestic job, proves that Callahan had no such special apparatus on the job.

Blake was a peculiarly blind and unobservant observer.

He says that the Majestic Theatre was a steel frame work, whereas actually it was a reinforced concrete construction with no steel frame work, as is clearly shown by appellees' exhibits 44C and 44D.

Again, respondents admit the existence of Callahan apparatus on the Timken Building in San Diego in the summer of 1908, as shown by petitioners' exhibit C, and yet Blake, when he visited this Timken Building, failed to observe this apparatus.

Testimony of such a witness that he did not see this, that or the other thing is valueless.

The fact that this unobservant witness up to 1912 had neither seen nor heard of petitioners' apparatus and that at one time he had a conference with Mr. Engstrum, Sr., interrupting him in another conference and asking questions about a totally different subject-matter, is wholly immaterial.

Luther M. Hill was another witness on behalf of respondents. During the time of the building of the Majestic Theatre, Hill was an estimator and assistant superintendent for the Alta Planing Mill Company of Los Angeles. There is nothing to indicate in his testimony that during *that* period there was anything in his work which would cause him to pay especial attention to reinforced concrete building construction.

During the erection of this building he passed it night and morning on his way to and from work and says that he watched its construction. He says that his interest centered in the system being used to distribute concrete because it was new to him and seemed to have merits. He noticed the hopper elevated well above the place of deposit of the concrete and that the concrete was conveyed by gravity through a pipe. He thinks that this pipe was supported by scaffolding and tripods, in order that it might be accessible from scaffolding in order that the men

might shake it (Q9, R. 519), and at that time he knew of no other device for performing such labor, and that he *does not remember* having seen a boom used in connection with the spout.

It is to be noted that Hill does not make any positive statement that there was *not* any boom, but merely that he does not remember it. Such a statement, even from a careful and intelligent observer, is not sufficient to offset the positive statements of Callahan, Bryson and Parker that the spout of the apparatus *was* supported from the tower by a boom, and Parker, as already noted, stated that the spout was supported from the tower in order that workmen might get out on the spout and loosen the concrete.

Swan Johnson was another witness examined by respondents on this point. He was working for the Engstrum Company during the erection of the Majestic Theatre but was not in charge of any of that construction and does not say that he was employed on it. It is evident from his testimony that he was *not* employed on that job. He visited it three or four times "during the beginning of it" and recalls that one Saturday night "during the beginning of it" he met Mr. Engstrum on the job and that Mr. Engstrum was mad because the boys were using "too much lumber building towers and trestles for running concrete there, and that the trestles were for supporting pipes in certain places."

There is nothing in this deposition which in any way controverts, or brings into question, any of the positive and direct statements of Callahan, Bryson and Parker. There is nothing in the Johnson deposition to prove that there was an "excess of trestles" as asserted by respondents. Trestles might be used for many purposes in a building of this sort. It should be remembered also that Johnson was only a visitor on this job "at the beginning"

and his entire observations might have been prior to Callahan's appearance, the building at that time having reached the second story in the front part, and the work on the amphitheatre not having progressed to a point where the Callahan apparatus was used. It should also be remembered that the alleged conversation was with the senior Engstrum, deceased at the time the deposition was taken, and therefore not rebuttable.

C. W. Ellis was examined, after the trial, under leave of court to submit the deposition in support of a motion for leave to take surrebuttal testimony with respect to the alleged "prior use in San Francisco in 1906 and '07."

Examination of this witness as to other matters was, therefore, clearly improper and objection was entered thereto. The lower Court, however, admitted the deposition except as to all hearsay, which was stricken out.

Ellis testified that the Callahan patent in suit, and the Emtman patent 948723, which will be referred to later, covered the apparatus sold and used by the Concrete Appliances Company but did not cover it in detail (Q28, R. 562); and that, ignoring the details, the Emtman patent illustrated the apparatus commercially used by the Concrete Appliances Company, and that the structure shown in the Callahan patent was not commercially used.

In the first place this testimony is opinion evidence and there is nothing in it from which the Court can draw a conclusion as to the particular constructions referred to.

In the next place there is nothing in the deposition controverting the direct testimony of Callahan, Bryson and Parker as to the character of apparatus which was actually *and successfully* used in connection with the Majestic Theatre job.

Finally, respondents offer the evidence of K. O. Wetzel who was superintendent at the iron works and machine department of the Engstrum Company in 1908, but was

not connected with the company during the period of construction of the Majestic Theatre Building (Q20, R. 516).

He visited the Majestic Building, during its construction, in search of business.

There is not a word of evidence from Wetzel relative to the apparatus used on the Majestic job.

We have then the direct and positive assertion by Callahan that it was he who conceived and produced the apparatus used in fabricating the Majestic Building from the second story up, including the major portion of the floor of the amphitheatre; and that this apparatus comprised a tower, a hoisting bucket, a vertically adjustable hopper on the tower, a chute projecting laterally from the tower and arranged at its inner end to receive the discharge from the hopper, and a boom, comprising an outwardly projecting boom arm and a suspension line from the tower to the outer end of the boom, the chute being supported and carried by this boom and delivering to a distributing pipe or pan associated with the outboard end of the boom-supported pipe, and the chute and boom being vertically adjustable. We have the direct and positive statements of Bryson that Callahan disclosed this apparatus to him and then put it into operation on the Majestic Theatre job. We have the direct statement of Engstrum that Callahan was the designer and producer of this apparatus and that it was used on the Majestic job, and we have the testimony of Parker that such an apparatus was used on that job. Against this there is not a single word of definite and positive testimony.

During the time that the Majestic Theatre was progressing Callahan made a sketch or drawing embodying various improvements in details of construction (petitioners' exhibit B) and he remained on the job until the concrete

was all poured sometime during the summer of 1908 (Q41, R. 73), probably about the latter part of July.

About the middle of August, 1908, Callahan was given charge of the construction of the Timken Building in San Diego, California (Q43), and there erected the apparatus which is shown in petitioners' exhibits B and C, this apparatus being used in connection with the foundation of the Timken Building beginning in August, 1908, and continuing through the erection of the building.

An examination of Exhibit C discloses the precise structure illustrated in Fig. 1 of the Callahan patent.

Blake says that he saw the Timken Building in the summer of 1908 and did not see the special concrete distributing apparatus. In view of the fact that this building was not begun until August, 1908, it would seem that probably all that Blake saw was some early stages of operation or, more probably still, never saw the building at all.

He says that he has "no recollection of the apparatus that was used" (Q16, R. 406) on the Timken Building.

Bryson says (XQ104 *et seq.*, R. 439) that after Callahan had been on the Majestic job six or seven months he was put in charge of the Timken Building in San Diego and there used a "gravity system in a more complete state," comprising "a tower, hopper, mixer, pan, chute, pipe and what might be termed an arm or boom" supporting the pipe and supported from the tower by a cable, this apparatus being used on the Timken job throughout the entire construction.

In view of the striking similarity between the apparatus shown in appellants' exhibit C and the drawings of the patent in suit it is thought that no additional corroboration of Callahan's testimony as to the character and use of this apparatus on the Timken Building is needed.

Callahan's testimony corroborated by Bryson, that the Timken Building was started in the latter part of 1908, and completed in 1909 is not controverted.

A number of other equipments were produced and put into use under Callahan's direction, subsequent to the filing of an application for the patent in suit and an effort was made by Concrete Appliances Company to commercialize the invention by way of royalty for use, first at the rate of ten cents per cubic yard of concrete handled, and later at a lower rate. This method of commercializing the invention proved to be a commercial mistake. The devices suggested by or authorized by the patent owners proved, in some instances, to be structurally weak and to contain the usual "bugs" of new apparatus and respondents attempt to decry the invention because of these facts.

Respondents' own proof shows, however, that the invention was commercialized, to some extent, in a satisfactory manner, and it is not denied by them that the combination defined by the claims in suit has been commercialized to a very large extent by petitioner Insley.

The apparatus used on the Majestic Theatre job fully performed its function and the concrete was distributed thereby at a greatly reduced cost and in an entirely satisfactory manner. The same is true of the apparatus used on the Timken Building.

The effective date of the Callahan invention, therefore, as to conception and disclosure is the middle of December, 1907, with reduction to practice by the week of January 1, 1908. Any alleged anticipatory art must, therefore, antedate these dates, in order to be effective.

III.

The alleged prior uses of the plant of the patent were uses of parts or incomplete combinations only, which fell short of the complete combination of the patent.

None of them produced a contractor's plant adjustable to all the varied conditions of building construction. They consisted at best of apparatus designed for a particular job and did not result in the production of a plant, like that of the patent, usable on all ordinary jobs. Nor were they constructed and arranged to be adjustable to the entire building area and to rise with the building from floor to floor.

These alleged prior uses, arranged chronologically, are the following:

The Ingalls Building, 1902.

This consisted merely according to the respondents' principal witness A. E. Culp (R. 271), of the use of a chuting or spouting system, the concrete being elevated in a tower hoist and discharge in a hopper, *on the second floor only* of the building. All the rest of the concrete was distributed by wheelbarrows (*id.*, Q12), which was the method still in use at the time of Callahan's invention. The chutes were supported entirely by trestles, and the hopper was supported by a framework on the forms for the second floor. This is shown in Respondents' Exhibit 6.

There was no boom, and no receiving device or anything else supported on the tower or adjustable thereon. It lacked, therefore, the essentials of the patented apparatus.

The testimony of the other witnesses on this use (see

Mensch, Q5, p. 144 and Botsung, R. 277), adds nothing to the testimony of Culp.

Furthermore the apparatus was an abandoned experiment, was discarded after it was used on the second floor of the building (Q63, R. 274) and was not used again.

A significant fact, however, is that on the Masonic job at Toledo in 1903 on which the witness Mensch, an able engineer, was employed, concrete which was "semi-liquid," so that it could be "poured" into the forms was used, yet this engineer never conceived the idea of using a plant like that of the patent (Mensch R. 147).

San Francisco use, 1906.

The evidence in support of this use is conflicting and entirely unsatisfactory, and, like much of the evidence relating to the other prior uses, falls far short of the degree of certainty as to date and as to the nature of the apparatus used required by the well established rule.

> *Delaski Co.* v. *Fiske Co.*, 203 F. R., 986, 993—and cases cited.

Prior to the final hearing in the District Court respondents took three depositions in support of this use, namely those of Horton, Brown and Ayer (R. 527-556), in an attempt to show that an apparatus like that shown in Respondents' Exhibit 61 (a mere memory sketch made after a lapse of 14 years) was used by the Healy-Tibbetts Construction Company on piers 42 and 44 of the San Francisco waterfront.

At the hearing, petitioners' witnesses Engstrum, Ginsburg and Insley discredited this testimony, and the respondents thereupon obtained leave to take additional testimony. Thereupon Horton and Ayer only—although other witnesses were noticed—were re-examined, and in reply petitioners' witnesses Kebby and Tibbetts (R. 597-610) were examined.

Horton in his original deposition (R. 527-532) was quite sure that the apparatus used was like that shown in the sketch, Exhibit 61, but when recalled (R. 613-621), after further thought, and a discussion of the matter with others who were better informed than he, he was by no means sure of it. Horton was an "inside" man and not a mechanic, and evidently is not testifying from his own knowledge.

Ayer, however, when re-examined reiterated his testimony that the apparatus of 1906 was like Exhibit 61.

Now Exhibit 61 was not only discredited by petitioners' witnesses Ginsburg and Engstrum (R. 582-594) who had first hand knowledge of the apparatus used, *but is shown by the testimony of Insley (R. 596) to illustrate an inoperative structure.*

Furthermore, petitioners' witness Kebby (R. 597-607), who was the inspector for the Board of Harbor Commissioners of San Francisco on a near-by pier, made some photographs of similar apparatus used (Exhibits O, P and Q) and these photographs discredit the sketch and testimony of Horton and Ayer. He describes the apparatus, and his testimony together with the photographs, taken early in 1909 and about a year later, shows that the apparatus actually used was not constructed and did not operate as respondents' witness claimed. The concrete used was a very dry mix, and the conduit was a *substantially vertical pipe,* and no swinging boom was used.

Exhibit O clearly shows that, in the distribution of the concrete over an extended horizontal area, *there was no attempt to chute the concrete,* but, instead, the substantially vertical pipe *D* delivered into a fixed hopper on the platform and the concrete was delivered from that hopper into buggies *F* (Exhibit O) *and trundled to the desired points of deposit.*

Petitioners' witness Tibbetts was the Tibbetts of the Healy-Tibbetts Construction Company, the concern that used the apparatus and was the active construction manager on the work in question. He says positively that all the concrete on piers 42 and 44 *was distributed by buggies* from the mixer on the bulkhead, and that no barge-tower chuting apparatus was used. He also identifies Exhibit O.

He states that the apparatus was used on pier 38 and was not used on the earlier piers 42 and 44. He further states (Q12, R. 608) that this apparatus did not antedate the photograph, Exhibit O of May 25, 1909, by more than thirty days.

The testimony of Ellis does not strengthen respondents' proofs. He merely says (Qs 18-27, R. 561-562) the apparatus used embodied certain "general features" (Q20). There is nothing in his testimony that conflicts with the testimony of Kebby and Tibbetts that the apparatus was not actually used until 1909. Ellis says he took a photograph of the structure (Q21) but does not produce it. He is also contradictory (see Qs 23 and 24).

The answer to the testimony of Mr. Ellis is found in the fact that respondents' witnesses agree that the apparatus which was used on pier 38 in 1909 was exactly the same as the apparatus which they claimed was previously used on piers 42 and 44.

Furthermore the apparatus said to have been used in 1906 at San Francisco does not anticipate, and does not perform the functions of the apparatus of the patent, although it certainly would have been used to perform such functions—in view of the great need for haste in reconstruction after the San Francisco disaster—had it been capable of such use.

By reference to Exhibits O, P and Q, it will be seen that there was no boom carrying the conduit, and nothing

but a temporary strut or prop which could not swing up and down with the chute, and had only a very limited lateral sway. There was no vertical adjustment of chute, hopper or strut, and no means for supporting extension chutes. *There was therefore nothing in this apparatus which made it adjustable to different heights of building operations, or to cover any extended horizontal area.* The only reasonable conclusion that can be reached in this matter is that apparatus of the kind in question was not used in San Francisco until after the patentee Callahan produced it successfully, used it through 1908, and filed his application for patent for it in January, 1909.

The Webber Dam Job, 1906.

This apparatus is shown in Appellants' Exhibits 54, 55 and 56. The entire job was done at a level below the ground, where the mixer was situated. The engineers found it necessary to build a long trestle to obtain lateral distribution from the mixer, and to provide on this trestle hoppers at intervals with substantially fixed chutes. The chutes were of the ordinary grain spout flexible type and the sections were fastened together by means of lugs and chain (Fargo, Q20, R. 496). There were two suspension wires at each joint, and the main suspension wires had to be released from the trestle in order to move the chute laterally (*id.*, XQ43, R. 499).

This apparatus had no boom carrying the chute, or for other purpose, no vertical adjustment of chutes, hoppers or boom, and no provision for lateral movement, and therefore lacked several of the vital elements of the patented apparatus.

The Smith Lynnhaven Job, 1906.

The apparatus used on this job was produced by Arthur L. Smith, who is the patentee of the Smith Patent No. 948,796 of February 8, 1910 (R. 161), granted on an

application filed February 23, 1909, *more than two years after* this alleged prior use by Smith. Therefore, when Smith swore in his patent application that the invention *had not been used more than two years* prior to his application he presumably swore to the truth—which precludes this alleged prior use in 1906. Furthermore, Smith's application and the application for the patent in suit were in interference (Exhibit 63, R. 638) *and the claims here involved were awarded to Callahan,* Smith receiving only claims for a small improvement consisting of a second distributing chute swiveled to and beneath the outer end of the first chute (Claims, R. 168).

Smith testifies (Qs9-32, R. 217-219) that he used on the construction of the Lynnhaven Hotel at Norfolk, Va., in 1906, an apparatus like that shown in Defendants' Exhibit 20, in which there was an initial spout 4 pivoted to the hopper and supported at its outer end by block and tackle running back to the top of the tower, so supported that it could be swung horizontally.

While this apparatus was a mere temporary device at most, and lacked the boom chute arrangement and vertical adjustment features of the patent, its construction and operation are not sufficiently established.

The principal corroborating witness is T. A. Tatterson, who was not on the job at the time of the alleged use (XQs162-3), because he left in September, 1906, before the fourth floor was started, and returned in February, 1907, when they were working on the roof (*id.*), and the chuting—whatever it was—was used only from the fourth to seventh floors, as Smith testifies (Q32, R. 219).

Tatterson also says that the same apparatus was transferred from the Lynnhaven to the Vinery job (R. 263), but Smith says that the spouts on the Vinery job were supported on trestles (Qs65 and 66, R. 222).

Thornton, another witness, says that Tatterson was

really rarely ever on the job (Q77, R. 37), and as he was merely a timekeeper this is no doubt true.

Preson, another witness called to corroborate Smith, who inspected the job for the architects, says "that one or possibly two wooden troughs were constructed and placed on benches or saw horses "for the distribution of concrete over a restricted area where wheelbarrows could not be used (Q5, R. 239). He merely says that Exhibit 20 corresponds to the apparatus used by Smith "in a general way" (Q18, R. 240). He also says that the sketch, Exhibit E, corresponds "in a general way" (Q18 and 30) and the sketch shows an apparatus which does not include any chute sections at all. He draws no distinctions between the two constructions, and, therefore, does not identify either one or the other. His recollection as to details of the apparatus, as he admits is "rather indistinct" (XQs60-62, R. 244).

As counterproof, appellants present the depositions of Charles Copper (R. 20-25), William T. Baker (R. 25-31), W. N. Thornton (R. 31-37), Roland Brinkley (R. 37), F. M. Glines (R. 39-43), Carter Gray (R. 43-46), Andrew J. Kerns (R. 46-57) and J. S. Goldback (R. 58-66).

These witnesses testified very positively to the following facts among others:

That the concrete was distributed by means of wheelbarrows from the hoist hopper (Cooper, Q10, R. 20); that there was only a short chute for conducting the concrete from the hopper to the wheelbarrows; that the hopper was only three or four feet from the floor (Baker, Q34, and Cooper Q20); that the sketch made by Kerns (Exhibit E) correctly shows the apparatus used (Kerns, Q28, R. 49).

These witnesses were all connected with the job, at the time when Smith says the apparatus was used, and Kerns was the foreman in charge of the pouring of the concrete, so that if any such apparatus had been used, they would

have known of it. They all remember the tower, hoist, bucket and hopper, but saw no suspended chutes used.

American Theatre Job, 1907.

On the construction of this theatre (a steel frame structure), an apparatus consisting of a tower, a hoist bucket, a hopper supported in part by the tower and in part by the steel frame work, and a series of chutes was used. The chutes were supported by cables or trestles *from the steel framework.* The only visible evidence offered in connection with this use is found in a memory sketch made by the witness Goebel (Exhibit 37), which is merely an alleged idea conceived by that witness. As this American Theatre apparatus concededly lacked the boom, chutes carried by boom, vertically adjustable hopper and chute and the vertically and laterally swinging features of the patent, it need not be considered further.

The Gerhard-Clark School, 1908-1909.

The witness Gerhard first testified that this school was built in St. Louis by him during 1908 and 1909 (Q7, R. 335), but on further investigation he finds it was built during 1906. The distributing apparatus consisted of a tower, a hoisting bucket, a hopper and trussed distributing chute swiveled to the hopper and supported at its outer end by block and tackle from the tower, according to Gerhard. He says it was of the same general character as that shown in Exhibit 31 (Q13) except that the auxiliary support 5 was not used.

Edward Anderson for the petitioners, who worked on the job, fixes the date as 1906 to 1907, and describes the apparatus used as an ordinary wheelbarrow elevator (Q26, R. 105). He says that throughout the job the concrete was placed by wheelbarrows (Q9). He states positively that no such apparatus as that shown in Exhibit 31 was used on the Clark job.

Hooper Anderson, his son, corroborates his father in every particular (R. 107-109).

William B. Ittner (R. 109) whose testimony was stipulated, was the architect of the Clark school and visited the operations frequently. He recollects no such apparatus, and would have recollected it had it been used.

P. J. Curran (R. 110) testifies substantially to the same effect.

It is evident that Gerhard, who is uncorroborated, was mistaken even as to the use of parts of the plant of the patent in suit.

Franklin School Job, 1910.

Gerhard, the same witness who testified to the Clark School apparatus (Stip., R. 556) testifies that the photograph, Exhibit 31, was taken May 7, 1910, but as this was after the patent was granted, it has no relevancy.

Great Lakes Dredge & Dock Developments, 1906-1909.

Beginning in the fall of 1906, at Gary, Indiana, the Great Lakes Dredge & Dock Company used an apparatus consisting of a flat car, a concrete mixer mounted on the car, and possibly a boom having a slight angular movement, although this is questioned. A chute section supported in part by the boom received the concrete from a wooden trough. But as there was no vertical adjustment of anything and very little lateral movement, and the chutes were supported on the coffer-dam forms, this need not be considered. The apparatus is illustrated at the left of Respondents' Exhibit 17A and in the Cameron sketch, which omits the wooden trough which would interfere with the free swing of the boom-supported chute. The support of the outer end of the chute on the coffer-dam is also admitted. (See Depositions of Alderman, Creutz, Patterson, *et al.*, R. 281, *et seq.*).

In the Spring of 1907, the apparatus shown in Exhibits 17A and 17K were shifted alongside the intake ditch and used in the condition shown in the Exhibit 17M. This apparatus had a very limited lateral swing, and was not adjustable to reach various lateral points. It was not vertically adjustable, and there was no chute carried by the boom, although the outer chute was hung from the boom. It was a crude apparatus designed for the purpose of chuting concrete into an excavation and was not usable for building constructions, except possibly for one floor of a building, and then only if supplemented by wheelbarrows or other means to carry the concrete from the chute to points laterally removed therefrom. The chute extended from a short fixed chute on the platform under the mixer, and a limited lateral movement of its lower end only could be obtained, by twisting the joint of the chutes, as shown in Exhibit 17M. There was a total absence of any idea of vertical adjustability of the boom, or of the chute and of any provision for using the apparatus on different levels.

Portions 17B to 17J inclusive of Respondents' Exhibit 17 all relate to structures long subsequent to the Callahan invention. Exhibit 17B, for instance, is dated December 18, 1909. There is some testimony by Cameron to indicate that the structure was started the preceding year, but no proof as to its condition, so far as the boom supported chute is concerned, prior to December 18, 1909, which is long subsequent. In this apparatus there is no vertical adjustability of the boom or the boom supported chute but, instead, the chute is arranged to receive the direct discharge from the mixer. There is, therefore, a total absence of any hoisting mechanism.

It should also be noted that there is no corroboration of Cameron as to the date of construction of this apparatus. The only supporting proof is the photograph (17B) which is dated December 18, 1909.

The Great Lakes Dredge and Dock Company did ultimately, long subsequent to the date of the Callahan invention, produce an apparatus which responds to the claims in suit but this does not prove either anticipation of the Callahan invention or lack of invention.

The Great Lakes Dredge and Dock Company was, during this period, a very large concern, doing an enormous business throughout the eastern part of the country and fabricating large works (Williams Qs7 and 8, R. 570). They must have had under way during this period, prior to Callahan's time, concrete constructions in connection with which apparatus defined by the claims in suit would have been exceedingly valuable. Such apparatus, when finally developed by the company, after Callahan's time, did prove to be very valuable.

The company was constantly exercising its very best efforts to produce improved mechanism in order to increase efficiency of the organization (Cameron, XQ181-182, R. 212), yet it took this great organization several years to arrive at the Callahan level.

The Tootle-Campbell Building, 1908.

This apparatus, used sometime during 1908, in St. Joseph, Mo., was subsequent to the construction and use of the Callahan apparatus at the Majestic Theatre Building early in January, 1908, and also was of such a character that it did not realize the improvements of the patent. It had no boom or boom-supported chute, and no equivalent thereof. A cable was run from the top of the tower to a "dead-man" and the chute was suspended from this cable. This of course did not permit the chute to swing, and the chute could be moved laterally only when the supporting cable was attached, an operation involving considerable labor and expense. Such an apparatus is not usable for the purposes of the patented plant.

St. Louis Coliseum, 1908.

This use is also subsequent to Callahan's reduction to practice at the Majestic Building early in January, 1908. It was designed by Arthur L. Smith, who claimed to have used an anticipating apparatus at Norfolk, Va., in 1906.

This apparatus (see Exhibit 22), is shown in his patent 948,746, and comprised a tower, apparently initially *erected to the full height* to which it was to extend. The tower supported the hopper which could be, and was, raised from time to time. The chute was swiveled to the hopper and this chute was suspended by block and tackle from a horizontal yard arm pivotally mounted upon a vertical pivot *at the top of the tower.* So far as the testimony shows, this boom *was never moved vertically* but was placed at the top of the full height tower and served as the suspension members for the chute in its various vertical positions. Such suspension members, in the early stages of a job, would be very long and the chutes would be *too easily displaced laterally.* It would be practically impossible to have this peculiar type of tower and boom *grow in height from time to time.* Such possibility of growth is one of the essential characteristics of the Callahan structure.

The Coliseum structure being later than the effective date of the Callahan invention, has no bearing on the present case except as a basis for an assertion that there was no invention involved in the Callahan combination, because several other people in different parts of the country sooner or later thought of a similar combination. If a very great number of ordinary workmen in different parts of the country simultaneously produce similar mechanisms there is some force to such a contention, but *a multi-party interference is a common occurrence in the Patent Office* and the mere fact that several inventors in different parts of the country substantially

simultaneously produce an invention, is never considered indicative of lack of invention.

In this apparatus there is certainly no boom carrying the chute as in the patent and respondents' structure. The yard arm at the top of the mast or tower is simply a convenient means for attaching long suspension cables by which the chute is supported. Nor is there any vertical or horizontal movement or vertical adjustment of this yard arm, all of which are called for by the claims of the patent. Therefore, even if it were a prior structure it would not fully anticipate.

Grain Elevator Spouting.

The problems which confronted Callahan, in connection with a concrete structure which was to grow under the operation of the apparatus in suit, were quite different from the problems which exist in the handling of grain.

> "The same type or class of device finds different environment as it has different application; the application in instance will present problems that do not exist elsewhere, and the solution of which may be invention just because of the environment existing in that particular field. This is simple enough when observed, but Hoxie was the first one to see both that it was a desirable thing to do and how to do it; and we have no doubt that his combined thinking and acting in these respects amounted to invention above and beyond the mere details of construction." *Jackson Fence Co.* v *Peerless,* (c. c. a. 6th) 228 Fed., 691-5.

The Court of Appeals of the Sixth Circuit, in the Meinken case, fully considered this grain elevator spouting defense against the Callahan patent and threw it out as relating to a non-analogous art. Respondents in the present case say that the evidence here is different because some

of the witnesses have testified that when they came to spout concrete they used grain elevator spouting, but the record in this respect supports petitioners' contentions because, these witnesses, who testified about their familiarity with grain elevator spouting failed to produce the specific combination which forms the subject matter of the claims in suit. All they saw, in the grain elevator art, was some spouting. *What they didn't see, for years, was that it was desirable to mount a boom adjustably on a tower and in conjunction with the adjustable hopper also on the tower, so that the spouts would be wholly supported by the tower, through the boom, and could be vertically adjusted to keep in proper relationship with the hopper.*

Of course, many engineers knew of swiveled spouting and vertically fixed booms but, the record clearly shows that in the art to which the patent in suit belongs, engineers and inventors stumbled along without seeing the desirability of making the specific combination of the claims suit until after Callahan had made his invention, tested it out and reduced it to practical form. Respondents are raising the cry of "no invention" with the "*ex post facto* wisdom of the bystander."

The very fact that so many came so near the solution of the problem, without actually solving it, speaks loudly for invention on the part of Callahan.

This record discloses many instances where men highly skilled in the art, such for instance as Mensch, when they approached the problem of distributing concrete over extended horizontal areas at successively increasing heights, failed to produce the exceedingly simple and efficient Callahan combination, in spite of the fact that they were well acquainted with grain elevator spouting and with hoisting booms, and with the various other individual elements which Callahan brought together for the first

time in the complete and efficient combination defined by claim 5.

The prior structures are open to respondents; such constructions can be used in some places, but in its peculiar sphere, the Callahan combination is exceedingly efficient and respondents found that they had to use it. This fact in itself justifies appellants' claims.

PRIOR PRINTED PUBLICATIONS.

It is admitted that Callahan was not a pioneer in the chuting of concrete. So far as he knew he was a pioneer, but there is no doubt that the publications presented by appellants show that prior to Callahan's time, there had been considerable discussion among engineers and builders as to characteristics which a concrete mixture should have in order to be chuted and that it was quite common practice to chute concrete, in various conditions of fluidity, through chutes of various kinds and that in some instances swinging arms, fixed vertically and associated with the mixer were provided to support a swinging chute directly associated with the mixer and so arranged as to chute concrete into a hole in the ground. So far as we recall, none of the prior publications makes any disclosure which is materially different from the disclosure in the various structures which have already been discussed.

Respondents say, in discussing the various prior publications, that if a contractor were well informed in 1907 he could hardly have failed to try such an experiment. If this be true, why—in all the mass of respondents' testimony, relating to almost 57 varieties of prior devices—is there no showing of such an "experiment" prior to the Callahan invention? Healy-Tibbitts, in building pier 38 in 1909, did not try such an experiment but distributed all the floor concrete by using buggies.

Exhibit 52 is referred to by respondents with confidence, but as Exhibit 52 is an editorial written *five years after* the issue of the Callahan patent, it is thought that no more need to be said as to it.

The very fact that various publications considerably antedate Callahan, and that chuting of concrete in building operations had been carried on for years without anybody seeing the advantage to be gained by the vertically-adjustable boom-chute arrangement, supports our contention that inventive thought was necessary on the part of Callahan to first produce that combination.

PRIOR PATENTS.

While there are many patents offered in the evidence of this case which were not in evidence in the Meinken case, before the Circuit Court of Appeals for the Sixth Circuit, there is no substantial difference and no closer disclosure than was to be found in the prior patents before the court in the Meinken case.

Where a Circuit Court of Appeals, especially of the character of the Circuit Court of Appeals of the Sixth Circuit, has carefully considered prior patents and has decided that the disclosures of said patents are insufficient to anticipate the patent in suit, it would seem to be a waste of time to track over the same ground, especially in view of the fact that respondents did not consider them of sufficient importance to discuss them in detail in presenting their defenses to the lower courts, and the lower courts did not consider them important, except as showing the general state of the art.

It is believed sufficient to say that no one of the prior patents relied upon by the appellees in this suit discloses the combination defined by the claims in suit.

IV.

It is believed that the patent covers a specific combination of elements not found in form or equivalent in the prior art. The fact that plants embodying that particular combination of elements have gone into general use, and that contractors generally, and the respondents, are using that particular combination—in preference to all others open to them—indicates that it involved invention and accomplished a result not obtained before.

That the apparatus of the patent has great utility and has gone into general use is well established and in fact is not disputed (Thompson, R. 112-114, Insley, R. 119). The Court of Appeals in the Sixth Circuit so found (Opinion, par. 3).

The question is, therefore, one of *invention*, since there are obvious structural differences between the patented apparatus and the apparatus of the prior art and the patent is for a combination of co-operating parts and not an aggregation.

Patentable Combination of Old Elements.

It is undoubtedly true that the individual elements of the Callahan invention were old. It is also true that various combinations of two or more but not all, of these elements had been made.

In no single instance, however, was there a prior *complete* combination.

Under such circumstances, and where the complete combination is found to have capacities exceeding the capacities of the earlier art, it has been repeatedly held that a patentable combination has been produced.

> "If every element was old, invention would still exist if the combination either produced a new and useful result or effected an old result in a new and materially better way." *Proudfit Co.* v. *Kalamazoo*

Co., 230 Fed. 127. See also *Loom Co.* v. *Higgins*, 105 U. S. 580, 26 L. ed. 1177; *Ferro Concrete Co.* v. *Concrete Steel Co.*, 206 Fed. 666.

"It is true that each one of these missing elements can be found in some one of the prior patents; but this is not enough to negative invention. If the selection of elements from existing machines into a complete combination has, for the first time, produced from a practical and commercial aspect a new result, invention may be predicated thereon * * *." *Cadillac Co.* v. *Austin*, 225 Fed. 990 (C. C. A. 6th).

"In many inventions there are two distinct steps: first, the conception of the general result wished for; second, the discovery of the way of obtaining it. In a large majority of cases, perhaps, the first may be obvious to any one interested in a particular art, and it is the second which calls for the exercise of inventive genius. But that is not always so. It may well be that two or more machines, appliances or tools are old and well known. Some day it dawns on someone that, if they are combined, new and useful results will be obtained. It may be that, so soon as the advantages of the combination are understood the means of bringing it about are within the capacity of any fairly skilled mechanic. In a third class of cases inventive genius may be required both in perceiving the combination that is desirable, and in finding out a practical way of making it." *Rosemary Co.* v. *Halifax Mills*, 257 Fed. 222.

"The fact that each and every element of the combination claimed by Streat was at the date of his patent old and well known is not sufficient to deprive the invention claimed by him of novelty, for most of the inventions of the present day consist of the utilization ad adaptation of mechanical appliances that are themselves old and well known." *American Tobacco Co.* v. *Streat*, 83 Fed. 703.

"The presumption of invention is not overcome

> by the fact that an expert is able to build up the patented device by selecting parts taken from the prior art." *Stead Lens Co.* v. *Kryptok Co.*, 214 Fed. 376.

Respondents contend, as is quite usual in cases of this kind, where the prior art fails to disclose the specific combination covered by the claims and used by the defendants, that the claimed combination is perfectly obvious in view of what preceded it. There is a great temptation, difficult to avoid, to view the patented developments with the "*ex post facto* wisdom of the bystander" but, the proper rule has been well stated by Judge Mayer in *General Electric Co.* v. *Alexander et al.*, 277 Fed., 300, that

> "It is idle not to recognize that after acquired knowledge is a subtle and subconscious agent of inaccuracy and departure. The phrase 'anyone skilled in the art would have known' how to do then what is known how to do now is the danger signal which admonishes courts to be cautious."

In the present case the record shows that many approached to the ultimate solution attained by Callahan, but Callahan was the first to reach the complete solution and if that particular solution has a distinct place in the art it should be protected. Such protction does not take from the respondents anything which they theretofore possessed but leaves them perfectly free to utilize the prior art structures.

Callahan's advance over the prior art is well summarized in the opinion of the Court of Appeals for the Sixth Circuit (Appendix A) quoted elsewhere in this brief.

Respondents say that Callahan's invention is but "natural evolution."

Mush concrete—fit to be chuted—was known long prior to Callahan, though Callahan thought he was original on this point also.

But, mush concrete having been used as early as 1903, there was a period of more than five years during which the "natural evolution" failed to produce the Callahan combination. Great Lakes Dredge and Dock Company took eight or nine years to do this "natural" evoluting and "arrived" long after Callahan.

The line of "natural evolution" is freely open to respondents. No right has been taken away from them. They are free to use any of the old combinations in the old way. But this is not what they want. Instead they wanted to use, and did, use the Callahan invention.

The Alleged Prior Invention by Emtman.

Respondents are contending that Emtman and not Callahan was the inventor of the apparatus which was used in connection with the Majestic Theatre building. So far as we have been able to find, there is no testimony to support this contention. All of respondents' contentions, in this direction are based upon inferences drawn from remote premises. Emtman does not claim invention, except as he may be considered to have claimed it in the *ex parte* affidavit in connection with an interference proceeding when he set up dates which correspond to the Majestic Theatre operations.

Facts of this kind, however, cannot be proved by inference but must be proved beyond reasonable doubt by the testimony of witnesses open to cross examination.

Emtman was called as a witness for respondents. He proved a very unsatisfactory witness, but surely that is no reason for the court to rule that, because of the unsatisfactory character of the testimony, it must be assumed that Emtman was the inventor of the Majestic Theatre apparatus.

Even if Emtman had made the direct claim that he was the inventor of the Majestic Theatre apparatus respond-

ents would not have proved, thereby, that such was the fact. Corroborative evidence would have been necessary on this point. No such corroborative evidence was presented, or even attempted.

The claim, therefore, of prior invention by Emtman, is entirely unsupported.

THE EFFECT OF THE INTERFERENCES.

During the pendency of the Callahan application an Interference was declared between said application and an application filed by Arthur L. Smith, which application later develeped into the Smith Patent No. 948,746. The issues of said Interference all included the alleged improvement in the apparatus described as "a secondary distributing pipe revolubly mounted beneath the mouth of the first distributing pipe" (count 1), "a second distributing pipe revolubly mounted" (count 2) and "a horizontally rotatable delivery pipe" (count 3).

Callahan conceded priority of invention to Smith *only* of the *particular combinations* defined by these counts. (See pages 104 and 105 of the joint exhibit, Sixth Circuit Court of Appeals record.)

Respondents urge that this concession of priority places Smith's disclosure, as found in his patent No. 948746, in the prior art and that the claims, upon which concession was made, are very broad and dominating.

An examination of the counts of the Interference shows, however, that these contentions are not well founded. It is to be noted that the claims upon which Callahan conceded priority to Smith do not in any way involve or include a vertically adjustable hopper, or a vertically adjustable boom-chute combination, or a hopper carried by the tower, or a chute carried by the tower. Instead, all are directed to a specific combination including *a pair of pivotally connected chutes*, the upper one of which is

associated with an elevating means so as to revoluble in a horizontal plane and the lower one of which is revoluble relative to the lower end of the upper chute.

The claims are broad in so far as they are not limited to a vertically adjustable hopper, or a hopper carried by the tower, and are not limited to any particular means or manner of supporting the first chute section on the tower, but they are exceedingly narrow in that they are specifically limited to a construction in which there is a *second* chute section which is *revolubly connected* with the first chute section.

The precise question was carefully considered by the Court of Appeals of the Sixth Circuit and that court said:

> "It goes without saying that the Smith patent can get no advantage merely because it has been owned and commercially exploited along with the Callahan patent. Upon this record Smith cannot claim to be the inventor of anything shown by Callahan's application, except as the latter is modified by the later concession of priority. The Callahan patent is not a part of the prior art, in the sense in which that phrase is used with reference only to publications, but the Smith patent, both as to anticipation and as to the presence of invention, must be judged upon the basis of which the earlier Callahan application is a part. It must, therefore, be assumed, as against Smith, that the advance of his claim 1 consisted merely in taking the concrete elevating and distributing apparatus of Callahan and substituting for Callahan's simple discharging conduit, revolving only at the point of attachment to the receiving hopper, the compound discharging conduit consisting of two or more sections revolubly connected with each other." (262 Fed. 960.)

In the case of *Cropp* v. *Standard* (256 Fed. Rep. 668), the patentee of the patent in suit, in an interference with the defendants' patentee, on claims which included an ele-

ment not invented by him, disclaimed the interference count, and the Court of Appeals for the Seventh Circuit, in answer to the defendants' contention that the disclaimer deprived him of the right to claim the invention broadly and without this element, said (p. 668):

> "Indeed the Standard Company does not seriously dispute the legal principle involved in the Reed case, namely, that a claimant of a generic invention does not lose his right by declining to claim some other persons' subsequently devised form."

The "Reed case" referred to was the case of *Reed* v. *Cropp et al.*, in the same court (239 Fed. Rep. 869), in which the law and the rules of the Patent Office relating to the questions involved were fully discussed and the rule above stated laid down.

A concession of priority or a disclaimer relates only to the particular subject-matter involved, and Callahan's concession of priority related only to the "secondary distributing pipe revolubly mounted beneath the mouth of the first named distributing pipe," or its equivalent (which was the only thing conceded to Smith) which was used in the combinations of the counts.

It is clear, therefore, that all that Callahan conceded to Smith was that Smith was the first to provide the specific revoluble connection between the first and second chute sections, *irrespective of how the chute sections were supported* relative to the hoisting means and hopper. Such a concession, however, did not surrender Callahan's right to be considered as a pioneer in providing the specific combination defined by the claims in suit which combination involves the vertically adjustable hopper and the co-relatively vertically adjustable boom and first chute section *carried by the boom from the tower*, and by means of which *it became possible to also support a second chute section from the tower*, and thus leave the working space

adjacent the tower entirely free from all supporting mechanisms, and yet permit the distribution of concrete throughout the entire area within the radius of the first and second chute sections.

Respondents draw the inference from the Emtman-Callahan Interference and Emtman's concession to Callahan, that Emtman must have been the inventor of the Majestic apparatus because the dates given in his preliminary statement correspond to the dates of that apparatus, while the dates given by Callahan in his preliminary statement correspond to the Timken apparatus at San Diego.

It is believed that this inference is not well founded. It must be remembered that Callahan, when he filed his application for patent, was proceeding independently and was represented by an attorney in Washington, a long way from Los Angeles. Everybody knows that the average inventor has no real conception of the extremely technical character of a preliminary statement. Callahan was unfamiliar with patent matters and it is quite clear that, in making his preliminary statement, he assumed that he was asked to tell about his *perfected* apparatus which he had at the Timken building in San Diego, because that is the apparatus which is specifically illustrated in the patent in suit. Quite naturally, therefore, he might fail to set up the dates of the Majestic operations purely because the Timken building apparatus was illustrated in his application for patent.

On the other hand, as soon as the Interference was declared, Emtman abandoned his claims relating to the Majestic apparatus and conceded them to Callahan. It should be noted in this connection that the claims of the Emtman patent 948,723 are specifically limited to a construction which involve *a mast* rotatably mounted *at the top* of the tower.

Emtman's preliminary statement was made *ex parte*

and, as he was under the impression that he could "get away with it," he may have asserted the Majestic dates. Whether or not Emtman had the Majestic Theater apparatus in mind in his preliminary statement, is purely a matter of inference. He does not specifically refer to the Majestic Theater and, so far as this record shows, the similarity of dates alleged in the Emtman statement and dates of the Majestic Theater job is a mere coincidence. But Emtman's concession of priority to Callahan of the specific subject matter of the claims now in suit in this case, tends to show that Emtman was not the inventor of that construction.

ALLEGED INOPERATIVENESS OF CALLAHAN.

Respondents have presented some proofs to the effect that some of the apparatus made under license from the original holder of the Callahan patent, was not successful and that blue prints furnished by the patent owner illustrated apparatus which when built, were tried and found unsatisfactory, and abandoned.

It is admitted by respondents' witnesses, however, that other apparatus licensed by the patent owner operated satisfactorily.

Respondents' proofs also show that the apparatus used by Callahan on the Majestic Theater job in the early part of 1908, and the apparatus used on the Timken job in the latter part of 1908 operated to such a degree of satisfactoriness that the buildings were constructed by the use of the apparatus in an entirely satisfactory manner.

A mere inspection of the patent in suit is convincing that the structure therein disclosed is an operative structure capable of performing the functions for which the apparatus was designed and there is no evidence which in any way fairly criticises this apparatus or proves its inoperativeness.

The mere fact that Callahan's early piping was too small in diameter or that, in the commercial development of the apparatus it was found that open chutes were more satisfactory than closed pipes, is wholly beside the point.

The fact remains that the apparatus disclosed in the patent in suit is capable of successful operation and it is not necessary, under the patent law, that the apparatus disclosed in the patent shall possess the highest degree of efficiency.

It has been repeatedly held, and is, in fact, one of the "fixed laws" relating to patent that, in order that a patent be sustained, it is not necessary that the disclosed structure be capable of the highest degree of efficient operation. *Engineer Co.* v. *Hotel Astor*, 226 Fed. 783; *Mineral Separation* v. *Hyde*, 242 U. S. 261, 61 L. ed. 286 (and many other decisions).

THE CALLAHAN VANCOUVER TESTIMONY.

There is nothing inconsistent between Callahan's present testimony, and his preliminary statement in the Interference proceedings, and his deposition given in the Vancouver case (which is not properly before the Court).

In the Vancouver case the Callahan Canadian patent (corresponding to the patent here in suit) was sustained as for a patentable combination.

In the Vancouver deposition he was asked as to whom he had "the completed apparatus" and the reply evidently had in mind the perfected form of apparatus which was used by him in connection with the Timken building, and illustrated in considerable detail in his Canadian patent, which was in all substantial respects like the patent here in suit.

So far as the combination defined in the claims in suit is concerned, which does not specifically include the second rotatable chute section, but which merely defines the

fundamental combination by which this second chute section may be wholly supported from the tower, Callahan undoubtedly had this in actual operation in connection with the Majestic building, but, at the time of his examination in the Vancouver case, he evidently thought that the question as to the "completed apparatus" required an answer relating to the Timken apparatus.

Long before the present controversy Emtman had conceded to Callahan priority of invention as to the particular combination which is defined by the claims in suit (see Exhibit 6th C. C. A., pp. 111 and 112).

V.

It is respectfully submitted that the decision of the Third Circuit Court of Appeals is erroneous, and that the decision of the Sixth Circuit Court of Appeals should be approved.

The Circuit Court of Appeals for the Sixth Circuit held that even though the improvements defined by the claims of the patent in suit be regarded as a combination of old elements it was patentable invention to bring these elements together in such a way as to form the plant covered thereby, whereas the Circuit Court of Appeals for the Third Circuit has declared that there was nothing new or patentable in this combination. In both Courts the particular entire combination of elements was not found in the prior act. This is apparent from a reading of the opinions. It is further apparent from the records that certain of these elements were not found in the particular form in which they appear in the patent. The Court in the Third Circuit however, held that this combination was but a natural assemblage of parts, made to meet the conditions and serve the purposes which the patentee had in mind, whereas the Sixth Circuit Court

of Appeals held that invention was required to bring these parts together into a unitary structure or plant. It is contended that the decision of the Sixth Circuit Court was correct and that the decision of the Third Circuit was erroneous.

As we have seen, the claim of the patent taken by the Court of Appeals for the Sixth Circuit as a typical definition of the improvements is claim 5, which is for an apparatus consisting of a combination of the following parts or elements:

1. A tower,
2. A conduit extending laterally therefrom,
3. A suitably supported horizontally-movable boom *carrying the conduit;* said boom being *adjustably connected* with the tower and adapted to be arranged *at various points in the height thereof,*
4. Means for raising plastic material to the point desired in the height of the conduit (tower),
5. Means for receiving plastic material from the raising means and conducting it to the conduit; said receiving and conducting means being *adjustable in the direction of the height of the tower.*

In other words, it calls for an apparatus consisting of (1) a tower, (2) a conduit, (3) a swinging and vertically adjustable boom carrying the conduit, (4) a hoisting bucket or the like, and (5) a vertically movable bin or receptacle communicating with the conduit.

The details of the illustrative embodiment of the improvement claimed are fully described and shown in the specifications of the patent, and need not be here described at length. The patent is not limited to such details of construction (Pat. p. 3, lines 69 to 77).

Concerning this apparatus the Court of Appeals for the Sixth Circuit said (262 Fed. Rep. 961):

> "It occurred to Callahan that he could construct a tower, or skeleton elevator shaft, which should originally extend, or which, by successive additions, should be made to extend well above the highest story of the proposed building; that he could attach to this tower, and make *vertically adjustable thereon* a receiving bin or hopper carrying a downwardly inclined and revolubly connected discharge chute, which could be swung about to reach various points on the next lower level to that where the receiving bin was fixed; that this receiving bin and its discharging apparatus could be temporarily fixed, as the building advanced at positions on the tower suitably elevated *above each successive story;* that the mush concrete could be elevated inside the tower to these various fixed positions and there dumped into the receiving bin; and that, in this way the mush concrete could be delivered *in an approximately automatic way throughout the successive floors or levels of a building, no matter how high.* Upon this record, this general thought was wholly novel. It has proved to be of great commercial value."

The Court of Appeals for the Sixth Circuit further said (*Id.*, p. 964):

> "Callahan's conception, that this material could be thus treated so as to deliver it from the ground all about the successive several floors of a high building and with practically no manual labor, except that involved in the story by story adjustment of the apparatus, involved, we think, inventive thought of a high order, when accompanied as it was by the devising of suitable apparatus to carry out the thought, which apparatus substantially differed from anything which had ever been constructed for any purpose, although every element was old."

And again, in stating that the apparatus answered the test of the decisions of this Court, and the lower courts, and possessed the requisites of a patentable combination (*Id.*, pp. 965-966):

> "On the other hand, we recall no instance of combinations of old elements which had been held to produce 'a new result' in a patentable sense and which better deserves that commendation than does Callahan's. The *quasi automatic* elevation and distribution of wet concrete under the varying conditions of *progressive* building and *by a single apparatus* was an entire novelty. No one had tried to do it; apparently, no one had thought of it; it was useful in a very high degree; and when we find a new result in this complete and extreme sense accomplished by a confessedly new combination though of known means—we think both the purpose of the patent law and the rightful application of the decisions thereunder require that it should be awarded the merit of invention.
>
> "We have stated our conclusion that the device of the patent is not an aggregation, in the sense that it represents such a mere assembling of old elements as might have been made by the exercise of only ordinary skill. It is at least equally clear that the device is not an aggregation in the more technical sense of the word, but is rather a true combination. It is true that the use of the apparatus involves successive steps, and is at each of its stages under direct or indirect manual control; but in a fair sense the entire operation of elevating and distributing the concrete is a *unitary thing. From the time it starts on its journey from the ground to the time it is deposited in the form, its progress might well be automatic.* There is clear distinction between this performance and that of the associated washing and wringing machines, discussed by the Supreme Court in *Grinnell Co.* v. *Johnson Co.*, 247 U. S. 426, 38 Sup. Ct. 547, 62 L. Ed. 1196."

A pertinent statement in the specification of the patent (p. 3, line 60, *et seq.*) is the following:

> "It will also be manifest that as a building is raised the booms and the appurtenances can be raised, and when the apparatus is in use the only manual labor necessary to the successful operation thereof is one man on the platform D, one man to manipulate the lines of the booms, and three men to supply and set materials and tamp walls, etc."

That the combination of parts in the manner specified produced a new article—a universally usable and adjustable gravity concrete distributing plant—and a new result seems indisputable. But the Court of Appeals for the Third Circuit held that this did not involve invention, but was the result of mere bringing together of old parts by the exercise of ordinary skill.

The Court of Appeals for the Third Circuit, however, *did not base its decision on claim 5 of the patent,* which the Court of Appeals for the Sixth Circuit regarded as the best definition of the invention. The decision in the Third Circuit appears to have considered only claim 1, which is the claim quoted in the opinion, and which is *for an incomplete sub-combination.* The Court of Appeals for the Third Circuit in this opinion, said:

> "On his apparatus, Callahan was allowed the claims here in question, viz.: 1, 2, 5 and 13, of which the first reads:
>
> "'An apparatus for the purpose described, comprising a tower, a suitably supported horizontally movable boom connected therewith, a conduit carried by the boom, means for raising plastic material to a suitable point in the height of the tower, and means for receiving plastic material from said raising means and conducting the same to said conduit.'
>
> "This is fairly illustrative of the elements of the

> other three claims. The elements of the quoted claim are first 'a tower'; second, 'a suitably supported horizontally movable boom connected therewith'; third, 'a conduit carried by the boom'; fourth 'means for raising plastic material to a suitable point in the height of the tower,' and fifth, 'means for receiving plastic material from said raising means and conducting the same to said conduit.'"

The elements of this claim are then compared with the prior art—but without considering the conduit *"carried by the boom"*—and the conclusion reached that the elements of this *incomplete* combination were found in the prior art.

It will be seen therefore that the Court in the Third Circuit, in comparing the apparatus of the patent with the prior art did not consider two of the important features of the apparatus, viz.: (a) the *combination of boom and conduit,* which made the extended suspension of the gravity feeding devices to cover all building areas possible, and (b) and the *vertical adjustability* of the receptacle and the boom which enabled the plant *to rise with the building* to any desired height.

The first element is expressed in claim 1 but does not appear to have been taken into consideration, and the second element is not expressed in claim 1 at all, and also appears to have been overlooked by the Court in comparing claim 1 with claim 5.

The court says, speaking of the tower:

> "There was of course nothing new in his element of his elevating tower. That was as old as the elevator art. Making it extensible from story to story involved no more invention than if he had built his tower complete at the start and allowed his building to build up to tower height instead of the tower to the building height."

But it is not the extensibility of the tower that is of such importance (the claims do not specify an extensible tower), but the vertical adjustability of the bin or receptacle and the boom conduit on the tower.

The court further says of the receptacle:

> "A receptacle for storage at the top was a common practice in grain and coal devices and a boom to carry a chute or trough was common in the grain and concrete arts."

This is very true, but it does not touch upon the vital points which are that the conduit *is actually carried by the boom,* and that the receptacle for storage is not at the top of the tower but is *adjustable throughout the height of the tower* to serve all levels of the building from the ground to the roof.

THE DECISION OF THE CIRCUIT COURT OF APPEALS FOR THE THIRD CIRCUIT.

It is true that the apparatus in question is used for "wet" or "mush" concrete, as the court says, and that such concrete came into general use not long prior to the date of Callahan's invention. Such concrete, however, was used more than five years prior to his invention, as shown by respondents' evidence in connection with the Ingalls' Building prior use of 1902 (Muensch, R. 146-148; Culp, R. 273). No doubt it was also used to some extent long prior to 1902. As we understand the Ney patent No. 939,072 of November 2, 1909 (R. 846) it was not granted for wet concrete, but for concrete "having therein cells or cavities formed by the withdrawal of water by crystallization" (see claims). Ney in his specification speaks of the use of what is known as "dry" cement as "the general practice" (lines 16-23, R. 847). If, however, the patent warrants the inference that the Patent Office considered wet concrete a new thing in 1909, it must be

assumed that the Examiner who allowed it was not familiar with the practices of the art, in the light of the other evidence in this case.

But even "dry" concrete can be chuted, if the chute is given a relatively steep inclination, and the earlier patents in this record show that this was understood (Potter, British Pat. of 1864, R. 872-876, line 5, and 877, line 18; Montgomery, 1902 Pat., R. 737-739, lines 24-46). It is thought that even had wet concrete not gone into extensive use apparatus like that of the patent would have been found advantageous. It follows that there was need for such an apparatus long prior to Callahan's invention.

The fact that grain spouting and coal chuting apparatus was usable for concrete—possibly with some modifications—but was not used indicates that something more than the equipment provided by such apparatus was required. This apparently argues in favor of the Callahan invention, and not against it as the Court of Appeals in the Third Circuit thought.

This brings us to a consideration of closest approach to the patented combination in respondents' proofs, and the one most seriously considered by the Court of Appeals for the Third Circuit, viz.: the Great Lakes prior use of 1906-1907 (Depositions R. 281, *et seq.* and Exhibit 17M). This was not before the Court of Appeals in the Sixth Circuit, but it is submitted that the patents which were before the Court of Appeals taken in connection with the well known tower, and hopper adapted to be placed at different elevations of the tower (Exhibits 7, 8, 9, 10, "Old Placing Method" Sixth C. C. A. R. 153-156) are its substantial equivalent. Of these patents, perhaps the Baillie British patent of 1888 (R. 905) for coaling ships, the Clark patent No. 718,092 for chute (R. 798), the Parker patent No. 760,015 for Grain Conveyor, (R. 811) and the Theiss patent No. 866,166 of 1907 (R. 833) are the best examples.

These patents show that it was old to employ a hopper and a chute suspended from a supporting boom, with a certain amount of lateral movement, but without provision for vertical adjustment of either. Therefore we say that the present record appears to disclose nothing new in the way of anticipation except the actual use of apparatus of this character for the gravity distribution of concrete, which was we think assumed to be merely a new use for such apparatus by the Court in the Sixth Circuit.

Referring to Exhibit 17M it will be seen that the Great Lakes apparatus included a chute for conveying the concrete to the forms, a wooden trough acting as a hopper to receive the concrete from the mixer and feed it to the chute, and a boom extending out over the chute with ropes or wires by which the chute was suspended from it and supported. The witnesses state that the boom and chute could be swung laterally, but obviously this movement was limited. There was, however, no vertical adjustment of either boom, hopper or chute, and the boom and chute were not so connected that they moved together. It will be said that there was no necessity for vertical adjustment of the Great Lakes boom, chute and hopper, and no necessity for extensive lateral swinging, because the concrete was all placed at substantially one level and over a limited lateral area. It will further be said that if the nature of the work had required such adjustment and swing, the Great Lakes Company could have used the mast and hoist well known in the concrete art and would have mounted their apparatus so that it could be raised or lowered on the tower and swung through a long arc. The question therefore is—

Was it invention for Callahan to use the Great Lakes boom supported chute and hopper on a tower, and make them vertically adjustable and freely swinging thereon?

This involves a question of invention, which only this court can decide. If the court finds that there was great need for such an apparatus, in spite of the somewhat limited use of wet concrete, and it solved problems which engineers and workers in the art had failed to solve, the question should be decided in favor of the patent, even though the solution now appears to have been almost obvious. It is not claimed that any of the elements of the patented combination are separately new. The tower, the hoist, the hopper—possibly arranged to be shifted up and down the tower to distribute concrete at different elevations—and the boom-supported chute were known in the art. *Nor is the patent to be limited to any particular form of these parts, since the form may be varied within relatively wide limits.* The patent, if valid, must be held to cover a combination of these instrumentalities or their equivalents *arranged according to a certain general plan,* and for the purpose specified. If limited to anything less than this it would have little value.

The Matter of Costs.

A prevailing party is not entitled to recover, as costs, amounts which he has not actually expended.

By stipulation (R. 659) it appears that with the single exception of one item of $6.00, the respondents did not pay out, *or in any way become liable for* any of the items of costs which have been taxed in favor of petitioners. The above stipulation shows that a total of $1,951.66, taxed in favor of respondents, was never at any time, or in any part, paid by the actual defendants but

instead, all of the expenses of defending the suit have been paid by Sackett Screen & Chute Company, Chicago, Illinois, the manufacturer of the apparatus complained of, and that said company was not a party of record, either as defendant or as an intervenor. Petitioners contend that the Appellate Court in this case erred in affirming the order of the District Court (Appendix D) allowing the taxation of the "disbursements of the manufacturers" who were not parties to the suit.

Petitioners contend that the taxation of the said amount at $1,951.66, against petitioners and in favor of respondents, was entirely improper and contrary to law for the reason that respondents had not expended any portion of said amount and had never become liable for any portion thereof.

Stated in another way, petitioners contend that, where the costs and disbursements of litigation are paid by a stranger to the record, the prevailing party, on whose behalf such expenditures were made, is not entitled to receive from the losing party any portion of such sum so expended, either for himself or for the benefit of the stranger by whom the expenditures have been made.

The provisions of the Revised Statutes pertaining to costs and fees, and which may have a bearing upon the present question, will be found in Sections 823, 824, 848, 983 and 984.

The pertinent sections are as follows:

> "Section 983. Bill of costs, how taxed.
>
> "The bill of fees of the Clerk, Marshal, and attorney, and the amount paid printers and witnesses, and lawful fees for exemplifications and copies of papers necessarily obtained for use on trials in cases where by law costs are recoverable in favor of the prevailing party, shall be taxed by a Judge or Clerk of the Court, and be included in and form a portion of a judgment or decree against the losing party.

"Such taxed bills shall be filed with the papers in the cause."

"Section 984. Bill of costs to be sworn to before taxed or allowed.

"Before any bill of costs shall be taxed by any Judge or other officer, or allowed by any officer of the Treasury, in favor of Clerks, Marshals, Commissioners, or District Attorneys, the party claiming such bill shall prove it by his own oath, or that of some other person having knowledge of the facts, to be attached to such bill, and file therewith, that the services charged therein have been actually and necessarily performed as therein stated."

The whole idea of the taxation of costs is that the successful party shall be reimbursed to the extent of the proper taxable fees and expenses *which have been paid out by the successful party.* That is to say, the successful party shall be reimbursed to the extent permitted by the statute, for expenditures to which, according to the decree, he has been unjustly put.

Manifestly if the successful party (the respondents herein) makes no such expenditures, no such items can be taxed in his favor.

The basis of taxation of costs is not that, during the course of the litigation expenditures have been made, but that such expenditures have been made *by the successful party.*

In the present case, the respondents *of record* took no real part in the defense of the cause; they made no expenditures; are not now and never were obligated to pay a single penny of the $1,951.66. Petitioners have good reason to believe that, had it not been for the Sackett Company, and their assumption of the entire expenses of this suit, respondents would not have defended, and petitioners would not have been put to the great expense to which they have been put.

It is well settled that a bill of costs must contain only items which the *claimant* has paid or is liable to pay. *Corpus Juris*, Vol. 15, page 179.

We have been unable to find any decision of the point in question by this court but there are a number of decisions of lower courts which, we think, lay down the correct principles.

In the case of *Worcester* v. *Handy*, 23 Fed. pages 49-65, the question of costs is considered at length, and at page 62, near the bottom, we find the following:

> "The statute (section 983) allows the amount 'paid' to witnesses to be taxed. In *Cummings* v. *Akron Cement, etc.*, 6 Blatchf. C. C. 509, and *Dennis* v. *Eddy*, 12 Blatchf. C. C. 195, as is clearly to be inferred, the witnesses had been paid, and whether their fees were taxable, inasmuch as it was not shown that they had attended on the service of the subpoena.
>
> "If a party does not pay a witness either before or after he has testified, the presumption is that the debt is forgiven, unless the failure to pay is explained in such wise that the fee can be considered as if 'paid,' because both parties intend it shall be paid."

In the present case, if the witnesses were paid, they were paid by a stranger to the record and, therefore, so far as the appellees are concerned, it is exactly as though the witnesses made no claim for payment because, so far as the appellees are concerned, their services as witnesses were given freely and without expense to respondents.

In *Burrow* v. *Kansas City, etc.*, 54 Fed. 278, Judge Hammond said on pages 279 and 280:

> "Costs in the Federal Courts include, among other items, 'the amount paid printers and witnesses,' (Rev. Stat. Sec. 984 [9832]) and defendant

> can therefore recover here only the amount *actually paid by it* to each of these witnesses (*O'Neil* v. *Railroad Co.*, 31 Fed. 663; *Beckwith* v. *Eastern*, 4 Ben. 358; *The Highlander*, 19 How. Pr. 334). And it can not even recover the amount so paid if in any instance such an amount exceeds the legal fees due to the witness. Nor can these fees of the different witnesses be grouped together in order to make the sum equal or exceed the entire amount paid to them all." (Italics ours).

In *O'Neil* v. *Railroad Co.*, 31 Fed. 663, on page 664, we find the following:

> "Here the defendant denies its liability under the judgments rendered against it in these cases to anyone but the judgment plaintiff, and challenges the right of these two witnesses to make this application, as not being parties to the suit, nor seeking any relief or payment from the party at whose instance and for whose benefit the fees claimed were earned. In this and like applications the distinction between fees and costs has been entirely overlooked, the latter being an allowance, always given by statute, to the party for expenses paid or incurred in conducting his suit, while fees are compensation to an officer or witness or others for services rendered for the party in the progress of the cause. Strictly speaking, the prevailing party to a suit recovers, *as costs* against his adversary, *only the fees which he himself has paid or is liable to pay.*" (Italics ours.)

In *Shaw Electric Crane Co.* v. *Shriver*, 80 Fed. 640, Judge LaCombe held that the defendand could not charge as costs "anything for certification fees *which he had not paid.*"

In *Steffins, et al.* v. *Steiner, et al.*, 232 Fed. 862-864, the defendant, who was a lithographer, prepared certain lithographic exhibits but undertook, in his bill of costs,

to include certain items or amounts for overhead expenses, which were estimated, in addition to the amounts which were actually paid out by him. Under a rule of the court, "the amount paid for printing the record" was taxable as costs.

The Court of Appeals of the Second Circuit said:

> "The theory of this rule is that the litigant shall be reimbursed for his *actual expenditure* which, of course, must be a proper expenditure. If, as in this case, a defendant does his own printing, he should receive only the amount actually paid * * * we think, therefore, that defendants were entitled to tax only such sums as were paid by them for labor and material."

In the present case respondents paid nothing for printing; they did no printing; but their stranger friend made them a present of the printed record and respondents are now asking for nearly a thousand dollars for printing. Likewise, respondents were presented, without cost to themselves, with all of the other various items which go to make up the $1,951.66, *without any cost to themselves.*

Clearly if a man who prints his own record, and a party to the litigation, can only be reimbursed for his actual outlay for labor and material, and cannot be allowed any reasonable items for overhead, then surely the respondents here, who have expended nothing for material, labor, witness fees, overhead or anything else, cannot be favored with a bill of costs such as has been taxed in this case.

The lower courts, in allowing the taxation of the items under consideration, did so apparently upon the theory that, because the Sackett Screen & Chute Company was the manufacturer of the apparatus in question, and, therefore, vitally interested in the outcome of the litigation, *although not bound by any decree therein* because not

a party thereto, the respondents should be allowed to receive these items of expenditure on behalf of the Sackett Company.

This was, we think, a fundamental error because it is well settled that

> "A judgment for costs cannot be rendered in favor of any one but a party to the suit." *Corpus Juris*, Vol. 15, page 175.

It is a fundamental proposition that it is not permissible to do indirectly what may not be lawfully done directly. In the present case, no judgment for costs could be rendered in favor of the Sackett Company not only because it is not a party to the suit, but, also because throughout the litigation, although it had entire charge and direction of the defense, it remained so persistently under cover that, even up to the time of the taxation of costs by the lower court, it was not known to petitioners, and petitioners were under the impression that the expenditures on behalf of the respondents had been made by another stranger to the record.

If the Sackett Company, who paid out the items, is not entitled to a judgment for costs, the respondents herein may not, in the face of a showing that they made no expenditure, serve merely as agents for the Sackett Company for the collection of these items of costs from the petitioners.

The general rule adopted with respect to costs in this country is that they are penal in their nature and are, therefore, strictly construed (*Corpus Juris*, Vol. 15, pp. 24 and 25).

Respondents had been put to no expense in the defense of this cause, excepting only a single item of six dollars, to which no exception is made. Every other item involved in the defense has been given to the respondents without cost or liability. Under such circumstances the

lower courts clearly erred and should, therefore, be reversed as to the taxation of costs amounting to $1,951.66. The lower court should be instructed that only those items of expenditure actually made by a successful party may properly be taxed as costs.

For the foregoing reasons it is respectfully submitted that the decision of the Circuit Court of Appeals for the Third Circuit should be reversed.

ARTHUR M. HOOD,
STEPHEN J. COX,
CYRUS N. ANDERSON,
Counsel for Petitioners.

APPENDIX A.

No. 3241.

IN THE

UNITED STATES CIRCUIT COURT OF APPEALS
FOR THE SIXTH CIRCUIT.

CONCRETE APPLIANCES COMPANY, *et al.*,
Plaintiffs and Appellants,

v.

DIETRICH MEINKEN, *et al.*,
Defendants and Appellees.

Appeal from the Southern District of Ohio, Western Division.

SUBMITTED MARCH 5, 1919.
DECIDED JANUARY 6, 1920.

Before WARRINGTON, KNAPPEN and DENISON, Circuit Judges.

Suit upon patents numbered 948,719, issued July 8, 1910, to L. Callahan, and 948,746, issued February 8, 1910, to A. L. Smith.

This case involves the tower apparatus now in common use for elevating and distributing wet ("mush" concrete upon the successive floors of high buildings, constructed in whole or in part from that material. The apparatus, as now used, involves two steps: first, elevating the material to a reservoir or hopper bin temporarily fixed at the desired elevation in the tower; and, second, distributing it from that elevation, by gravity, through a conduit revolving at the point of connection with the hopper bin and having at least one swivelled elbow joint, whereby any desired point upon the selected horizontal plane can be reached for the gravity discharge of the material. Callahan and Smith each showed, in his drawing, the com-

plete apparatus, but Callahan made no claim to the feature of the double swivelled discharge pipe. Callahan's application was filed January 21, 1909; Smith's on February 23rd of the same year. The Patent Office notified Callahan that his application seemed to conflict with another, and suggested to him some of the claims which Smith had made. Callahan adopted these claims, whereby an interference was declared. The substance of the issue is shown by count one, which is given in the margin.(1) Upon this issue, Callahan conceded priority; judgment was rendered upon the concession; Callahan canceled these additional claims; and both patents issued. Both patents, by assignments, licenses, etc., became the property of the Concrete Appliances Company and Insley, and this suit was brought by them in the court below based upon alleged infringement of both patents. The above quoted count 1 of the interference became claim one of the Smith patent, and is typical of those sued upon. Claim 5 of the Callahan patent is here quoted(2), and may be accepted as a statement of his invention said to be infringed. Claims 1, 2 and 13 are also declared upon.

DENISON, Circuit Judge:

It goes without saying that the Smith patent can get no advantage merely because it has been owned and commercially exploited along with the Callahan patent.

(1) "In a device for distributing concrete, means for elevating the concrete to a point above the work to be performed; a hopper adapted to receive the concrete so elevated; a primary distributing pipe revolubly mounted beneath the hopper; and a secondary distributing pipe revolubly mounted beneath the mouth of the first named pipe, substantially as described."

(2) "Claim 5. An apparatus for the purpose described comprising a tower, a conduit extending laterally therefrom, a suitably supported horizontally movable boom carrying the conduit, said boom being adjustably connected with the tower and adapted to be arranged at various points in the height thereof, means for raising plastic material to the point desired in the height of the conduit [tower] and means for receiving plastic material from the raising means and conducting the same to the conduit; the said receiving and conducting means being adjustable in the direction of the height of the tower."

Upon this record, Smith cannot claim to be the inventor of anything shown by Callahan's application,—except as the latter is modified by the later concession of priority. The Callahan patent is not a part of the prior art, in the sense in which that phrase is used with reference only to publications, but the Smith patent, both as to anticipation and as to the presence of invention, must be judged upon the basis of which the earlier Callahan application is a part (*Lemley* v. *Dobson-Evans Co.*, 243 Fed. 391). It must, therefore, be assumed, as against Smith, that the advance of his claim 1 consisted merely in taking the concrete elevating and distributing apparatus of Callahan and substituting for Callahan's simple discharging conduit, revolving only at the point of attachment to the receiving hopper, the compound discharging conduit consisting of two or more sections revolubly connected with each other(3). We are not convinced that this advance involved any invention. Such a double swivelled conduit was a well known expedient for the gravity conveying of any material which it was desired to discharge at selected points in a lower horizontal plane. It is obvious,—at least when it is pointed out to us,—that with an inclined conduit swing at its upper end, the lower end could be made to reach any desired point on the lower plane, either by changing the angle of inclination and modifying the length of the conduit, as by telescoping a section, or by adding a supplementary conduit revolubly connected with the lower end of the primary one. Neither form had been in use for concrete (before Callahan), but both forms were old for other purposes. The double swivelled form had been most highly developed in grain elevators for distributing the grain from the elevated receiving bin to the several

(3) We speak thus of Callahan's form, because of the necessary effect of the filing dates, the concession and the form of the issued claims.

openings on the floor below, which indicated spouts leading to still lower storage bins.

If the matter were to be considered in the broadest sense, there might be such distinctions between elevating and distributing grain and elevating and distributing concrete that transferring a device from one art to the other and making the necessary adaptation would involve invention; that need not be decided; but here, *Smith begins at the point where the elevation of the concrete is finished;* he has then merely the question of gravity distribution. He finds that concrete has been distributed and grain has been distributed by a single unitary chute, swinging and turning at its upper end, and that grain has also been distributed by the double swivelled chute, thereby increasing the ability to select exactly the desired point for discharge. In the words which were used in *Crown Co.* v. *Sterling Co.*, 217 Fed. 381, Callahan had already "bridged over whatever gap there was" between the art of concrete building and the art of gravity distribution, and the "door of opportunity was open" to all who wished to use in the former art an expedient well known in the latter. It seems to us quite clear that there is no invention in adding to the device of Callahan the well-known additional swivelled joint in the discharge conduit. It follows that those claims of the Smith patent sued upon are invalid, and the decree of the court below, which dismissed the bill as to this patent, must so far be affirmed.

At the time these patentees appeared on the field concrete had already come into extensive use as a building material in connection with metallic re-enforcements, and it had been found that it was suitable for buildings of all shapes and of many stories in height. When mixed of the proper consistency, it was called mush concrete, and to handle this material and deliver it efficiently at the place of use in a large building operation was a considerable

problem. Various methods had been employed, but the one most approved consisted in raising it by elevator to the floor or level where it was to be used and there dumping it into wheelbarrows, by which it was conveyed to the various desired points of use upon that level. It occurred to Callahan that he could construct a tower or skeleton elevator shaft which should originally extend, or which, by successive additions, should be made to extend, well above the highest story of the proposed building; that he could attach to this tower, and make vertically adjustable thereon, a receiving bin or hopper carrying a downwardly inclined and revolubly connected discharge chute, which could be swung about to reach various points on the next lower level to that where the receiving bin was fixed; that this *receiving bin and its discharging apparatus* could be *temporarily fixed*, as the building advanced, as positions on the tower suitably elevated above each successive story; that the mush concrete could be elevated inside the tower to these various fixed positions and there dumped into the receiving bin; and that, in this way, the mush concrete could be delivered in an approximately automatic way throughout the successive floors or levels of a building, no matter how high. Upon this record, this *general thought* was wholly novel. It has proved to be of great commercial value. It is common knowledge that, largely within the period since the patent issued, re-enforced concrete has largely superseded all other materials in the erection of large structures, and the record shows that eighty or ninety per cent. of all the important construction work of this class in the country employs this Callahan method, and that all of the larger manufacturers of machinery and apparatus for this general purpose have taken licenses under the patent. It is not too much to say that the invention has played a large part in revolutionizing the building industry, and that it

is not common for a patent in litigation to find itself supported by such a large measure of commercial merit and public acquiescence.

It is not contended that the patent is anticipated, in the strict sense of that term, but the defendant's position, approved by the court below, is that Callahan only put together old and familiar elements, and that his advance did not involve invention over what had gone before. To determine this question, we must know, first, the character of the relations between what was old and this new arrangement, and, second, whether his claims are properly characterized by reference to his real advance. To elevate material to a fixed and invariable height and to distribute it therefrom, by gravity, through a swinging, revolving chute, to different discharge spots upon a lower level, was common. As we have said, in considering the Smith patent, this was familiar in the class of grain elevators. The typical so-called grain elevator, or storage house, was a permanent structure, and grain was carried by various types of elevating apparatus to the permanent top floor or level. From the bottom of the bin there situated, depended a swinging chute which could be moved about so as to discharge, upon the floor below, into any storage bin opening from that level. These grain elevators, like others of similar type shown by the record, entirely lack the only substantial novelty claimed for Callahan. *They did not have a temporary receiving bin or hopper with a connected discharge chute vertically adjustable in an elevator tower,* adapted to distribute the material upon successive levels. If invention lies in this thought and its practical application, the grain elevators are not important.

Next, we are cited to several examples of unloading apparatus for vessels, of which the English patent to Baillie, No. 10,380, of 1888, is as relevant as any. In this de-

vice, which was for transferring coal from a barge to the ship alongside, there was a receiving bin or hopper located in an elevated frame-work or staging on the barge, and from which a depending chute carried the material away by gravity to the proper bunker in the ship. The coal contents of the barge were raised to this point by an endless chain of buckets over an inclined mast or support pivoted to the vertical frame at its upper end. Evidently, as the contents of the hold of the vessel became lowered, this mast must be extended further down, or further to one side, and this could be done either by an extension of the lower end or by lowering the upper pivoted point. The patent shows both methods of adjustment. The bin and pivot could be lowered upon this supporting stage a short distance,—not more than the height of the bin. The point of final delivery was not changed. Such vertical adjustability as there was in the bin was incidental to raising and lowering the whole "tower" to accommodate it to the point where elevation began. We do not find here any substantial disclosure of the real novelty of Callahan's invention, as above stated.

This leaves for consideration only the patent to Theiss, *et al.*, No. 866,166, of September 17, 1907. It is not to be doubted that this is suggestive of the idea and the apparatus of Callahan; whether it is more than a mere suggestion is the question. Theiss' apparatus, like Baillie's, was intended for unloading coal from a barge and loading it into the hold of a ship. It consisted essentially of a tower-shaped structure permanently erected upon the deck of a barge or scow. It was intended to reach a distance substantially higher than the coal receiving hatchways of the particular ship which might be selected to be served; there was never occasion to make it any higher. This tower carried an elevator car or skip which was loaded with coal when it was at the bottom of the

tower, and then was elevated as far as necessary to be dumped into a receiving bin, which bin was capable of vertical adjustment on the tower. This receiving bin in turn dumped into a chute which, at its lower end, discharged through the hatchway of the vessel to be loaded. This chute was not revolubly connected with the bin or tower. It could not be moved laterally. It was carried, by the tower, in ways or guides which gave the chute its inclination and permitted it to slide therein longitudinally. There was a permitted adjustment of the guide by which the angle of inclination could be changed, but this was done by releasing and readjusting and refastening the guide-ways, and could not be done as a part of the operation of the device while in use. The adjustment and fixing of the chute, in order to discharge into a desired hatchway, was a complicated matter. First, the carrying scow must be so positioned and fastened with reference to the ship that the tower was exactly opposite the hatchway. Second, the receiving bin and the chute must be adjusted vertically in the tower at such a position that the chute, in its carrying guides, would be pointed at the hatchway. Third, the chute must be slid downward and outward in the direction at which it was pointed until its lower end entered the hatchway. If, then, it was next desired to reach another hatchway on the same transverse line, the vertical adjustment of the bin and the chute carrier, and the aiming of the chute at the new hatchway and its longitudinal extension into contact therewith, must be repeated. If it were desired to reach hatchways further forward or aft, the scow and its entire apparatus must be released and floated alongside the ship to its new position. In the broadest sense, this patent shows a plan of elevating material to an adjustable vertical height and from there distributing it by gravity to selected positions upon a lower level; but it shows this idea in a

very rudimentary form; it would be practically useless, for the purposes now involved.

In details of construction and of claim reading, there is ample differentiation. Claim 5 of Callahan, above quoted, will not read on Theiss. A comparison of the Theiss apparatus with this claim shows: (a) That the Theiss apparatus is not "for the purpose described," in any restricted sense of that phrase. (b) That Theiss has a relatively short supporting framework, rather than a relatively high and distinctive tower. (c) That while Theiss has "a conduit," it does not "extend laterally therefrom," excepting in the most general sense. (d) That Theiss has no "suitably supported horizontally movable boom carrying the conduit," nor anything which approximates such a boom. (e) That since he has no boom at all, of course, he has no boom "adjustably connected with the tower and adapted to be arranged at the various points of the height thereof"—but it must be said that Theiss' conduit itself has this vertically adjustable connection with the tower. (f) The remaining elements of the claim are literally met well enough by Theiss, save for the distinction as to their use with plastic material.

The question presented by Theiss seems not to be one merely of double use, because the structural differences are too great; but if the physical resemblance were much closer, the defense of double use would be far from satisfactory. (See *Ansonia Co.* v. *Electrical Co.*, 144 U. S., 11, 18; *Potts* v. *Creager*, 155 U. S., 597, 606-8; *Hobbs* v. *Beach*, 180 U. S., 383, 390; *Gold* v. *Newton*— C. C. A., 2—254 Fed., 824, 827.) *Certainly, the art of loading coal into a ship for fuel is not the same art as that of distributing wet concrete to a building structure; nor is the analogy very close.* It is not at all certain, even if probable, that an experienced building engineer, considering methods of handling wet concrete for a skyscraper, would call to mind a coal-

handling apparatus on a harbor scow. *On the other hand, it impresses us as a bold and original thought that this material could be handled in this way.* Distributing mush concrete through gravity chutes by one apparatus throughout the whole course of building obviously involved difficulties; it had never been handled by gravity chutes at all excepting under simple conditions where these difficulties did not exist,—and then, perhaps, had been done only on paper; on one side was the danger that it would adhere to the chutes and set and choke up the pipes at least at the valves and gates; on the other side, the risk that the elements would disintegrate and the water and the cement and the broken stone fall in separate strata. *Callahan's conception, that this material could be thus treated so as to deliver it from the ground all about the successive several floors, of a high building and with practically no manual labor, except that involved in the story by story adjustment of the apparatus, involved, we think, inventive thought of a high order, when accompanied as it was by the devising of suitable apparatus to carry out the thought, which apparatus substantially differed from anything which had ever been constructed for any purpose,—although every element was old.* It is true, in a sense, that the Callahan device is produced upon the basis of Theiss' structure by substituting for the longitudinally sliding and extensible delivery chute of Theiss, the revolubly mounted chute of the grain elevators; but this is not the whole truth. Callahan built up his tower to a height never thought of by Theiss, and which Theiss could not have accomplished without capsizing his barge; and Callahan supplied a chute-supporting boom attached to the receiving hopper and vertically adjustable with it, a feature which the grain elevators did not have and could not have used. He thereby laid the basis for adapting the structure to a

use fairly distinct from that of either a coal elevator or a grain elevator.

As upon every such question, there is no authoritative decision which compels one or the other conclusion; the doubtful inference is rather one of fact; but we select and refer to a few instances where invention has been found,—by the Supreme Court or by this court,—and the facts of which may well be thought to present no stronger inferences in its favor than do those of the instant case (*Loom Co.* v. *Higgins*, 105 U. S., 581, 590; *Hobbs* v. *Beach*, 180 U. S., 383, 393; *Expanded Co.* v. *Bradford*, 214 U. S., 366, 381; *National Co.* v. *Aiken*, 163 Fed., 254, 259; *Warren* v. *Owosso*, 166 Fed., 309; *Morgan Co.* v. *Alliance Co.*, 176 Fed., 100, 109; *Ferro-Concrete Co.* v. *Concrete Co.*, 206 Fed., 666; *International Co.* v. *Sievert*, 213 Fed., 255).

The test of the presence of invention in a new assembly of old elements is sometimes said to be whether a new result is accomplished. This is often not a helpful rule, because its application involves definition of the phrase "new result"; and this opens the original difficulty. Within a narrow definition, every new combination of old elements gets a new result, but this is not the sense in which the phrase is rightly used as indicative of invention. The recent opinion of this court in *Huebner Co.* v. *Matthews Co.*, 253 Fed., 435, illustrates this situation. The ultimate practical result at which the patentee and his predecessors aimed was to carry packages by gravity upon a runway from one place to another. The patentee was the first to accomplish this with such a degree of efficiency as to make the device commercially popular, but the same result, except in efficiency degree, had several times been reached before, and by apparatus so similar as to be superficially indistinguishable. The patentee had simply added the well-known and common mechanical refinements and expedients already used by others even in

the same art, *e. g.*, he used roller bearings instead of ordinary journal boxes, and we declined to regard this as a new result. We have no intention to depart from that line of our recent decisions (4) of which this one is typical; such refinements are not inventions. On the other hand, we recall no instance of combinations of old elements which has been held to produce "a new result" in a patentable sense and which better deserves that commendation than does Callahan's. The quasi-automatic elevation and distribution of wet concrete under the varying conditions of progressive building and by a single apparatus was an entire novelty. No one had tried to do it; apparently, no one had thought of it; it was useful in a very high degree; and when we find a new result in this complete and extreme sense accomplished by a confessedly new combination,— though of known means,—we think both the purpose of the patent law and the rightful application of the decisions thereunder require that it should be awarded the merit of invention.

We have stated our conclusion that the device of the patent is not an aggregation in the sense that it represents such a mere assembling of old elements as might have been made by the exercise of only ordinary skill. It is at least equally clear that the device is not an aggregation in the more technical sense of the word, but is rather a true combination. It is true that the use of the apparatus involves successive steps, and is at each of its stages under direct or indirect manual control; but, in a fair sense the entire operation of elevating and distributing concrete is a unitary thing. From the time it starts on its journey from the ground to the time it is deposited in the forms, its progress might well be auto-

(4) E. G.—Berger Co. *v.* Trussed Co., 257 Fed. 741; Edwards *v.* Dayton Co., 257 Fed. 980; Van Dorn Co. *v.* Mathis Co., 260 Fed. 400.

matic. There is clear distinction between this performance and that of the associated washing and wringing machines, discussed by the Supreme Court in *Grinnel Co.* v. *Johnson Co.*, 247 U. S., 426. In the latter case, both the judgment and the hand of the operator were involved, in submitting to the second operation the material which had finished the first; the juxtaposition of the two machines was a mere matter of convenience; in the present case, the operator can, at the most, only interfere to prevent the otherwise normal completion of second part of what is intended to be the unitary work; and even then his interference will only temporarily stay the normal action. We collected and commented on the decisions of the Supreme Court and other courts on this subject, in *Gas Co.* v. *United Co.*, 228 Fed., 684. Callahan's patent should not be condemned as an aggregation.

We do not overlook the fact that some, and perhaps a considerable portion, of the practical and commercial success has been due to the use of the feature covered by the Smith patent; but this does not detract from the patentable and inventive merit of Callahan's idea. An oscillating or swinging chute, even without Smith's secondary swivel, would make the primary distribution of the concrete throughout the floor or level, leaving the secondary and more accurate distribution to be accomplished by further means. We have held that the particular means adopted by Smith did not involve invention, and we can hardly say that much of the credit due to public use should be taken away from Callahan because he had not himself adopted an improvement and refinement which, however important to commercial success, was within the grasp of the men ordinarily skilled in the art.

We have considered claim 5. Claims 1, 2 and 13, also in suit, use more general terms and are superficially somewhat broader, but we think in connection with the

specification they necessarily intend that the means for *receiving the concrete from the raising means and taking it to the conduit are vertically adjustable in the tower.* This may fairly be implied from the requirement that the material is to be raised to a "suitable point" in the tower. It is then seen that all these claims involve what we have thought Callahan's meritorious invention, resting upon the successive story by story operation of the device. With this interpretation, they are not very different from claim 5, but should be treated as other expressions of the same thought in terms nominally of somewhat broader equivalency. These claims, also, should be considered valid.

Infringement is not denied.

The decree below, as entered, must be set aside and the record remanded for a new decree modified in accordance with this opinion.

IN THE

UNITED STATES CIRCUIT COURT OF APPEALS
FOR THE SIXTH CIRCUIT.

CONCRETE APPLIANCES COMPANY, *et al.*, *Plaintiffs and Appellants,* *v.* DIETRICH MEINKEN, *et al.*, *Defendants and Appellees.*	No. 3241. ON REHEARING PETITION.

March 2, 1920.

DENISON, Circuit Judge: The application for rehearing brings to our attention a matter not mentioned in the opinion. We selected claim 5 as the one most suitable

for study, because it expressly incorporated those features in which we thought patentable novelty was to be found. One of these features was the horizontally movable boom carrying the conduit, and "being adjustably connected with the tower and adapted to be arranged at various positions in the height thereof." We assumed that this referred to a *vertical adjustment of the boom in the tower*. The assumption is now challenged, because it is said that the adjustable connection between the boom and the tower was that mechanism which provided for a horizontal adjustment of the upper end of the boom on a horizontal track (which defendant has not used), and that the provision for vertical change of the boom in the tower is not adjustability, but rather refers to a dissembling of the parts in one location and reassembling them in another. It is true that the specification refers to a horizontal adjustability, but we do not think that it is this capacity to which claim 5 refers—at any rate, this inference is not clear enough to justify limiting the claim to a comparatively unimportant detail. Such an inference is contradicted both by the fact that this horizontal adjustability of the boom on the tower is made the special characteristic of a group of claims not in suit, and by the fact that the thought is stated in the claim in immediate connection with the reference to "various points in the height" of the tower, and after one reference has been made to the horizontal motion of the boom and the reference to that function apparently finished, while the draftsman turned to the thought of vertical change. It is true, also, that in the form of the invention shown in the drawings and specifically described, the vertical change was to be made by taking out bolts, removing the horizontal platform, raising it and bolting it again to a new position, and that this is not adjustability in the most precise definition. However, it is well within the sense

in which the word is very often used, and we must define it as the patentee intended. For these reasons we adhere to the interpretation of the claim in this respect which the opinion assumed.

It is also true enough that Callahan specifically contemplated building his tower up section by section, as the building progressed; but this was a matter of preference. His drawing shows the completed tower, permitting operation anywhere along its height, and observation of his plan of erection does not change our conception of the real disclosure.

In other respects, further review of the case leaves our stated conclusions unchanged, and the application for rehearing will be disallowed.

We note that the reference to a mixer, found in line 35, on page 8, is erroneous. The phrase should read "deliver it from the ground all about, etc." In line 31, p. 10, "mixer" should be "ground." In the last line of page 7, "adjustable" should be "adjustably connected." The clerk will make the corrections in the opinion on file.

APPENDIX B.

IN THE
UNITED STATES CIRCUIT COURT OF APPEALS
FOR THE THIRD CIRCUIT.

March Term, 1923.

CONCRETE APPLIANCES COMPANY AND WILLIAM H. INSLEY,
Plaintiffs-Appellant,

v.

JOHN E. GOMERY, JOHN C. SCHWARTZ, MICHAEL J. O'MEARA AND CONCRETE CONSTRUCTION COMPANY,
Defendants-Appellants.

No. 2982.

Appeal from the District Court of the United States for the Eastern District of Pennsylvania.

Before BUFFINGTON, WOOLEY and DAVIS, Circuit Judges.

BUFFINGTON, Circuit Judge.

In principle, this case concerns the use of gravity in conveying mobile substances from an elevated common central point to various working points; in application, to the distribution of "wet" or "mush" concrete.

Referring to the above general principle of conveying mobile matter by gravity, we have the age-worn practice of lifting water by power to a reservoir and by gravity distributing it through conduits to a fixed point or by hose to diverse points. In other words, the problem of lifting it to a gravity-sufficient height; of there accumulating it

in storage; from thence conveying it by conduit to a determined place or by hose to an optional point of use. Naturally such general practice was early applied to the movement of such a mobile matter as grain when its volume became large and the word "elevator" became a synonym for the raising, storage and distribution of grain, into individual cars, the ends of the same car, into ships, and indeed into separate hatches.

As an example of the common practice the proof is that prior to 1905 and since then, practically all elevators delivering grain to ships have been equipped with pipes, extending downwardly from the side of the elevator and supported by horizontally movable booms for directing the outlet of the pipes to any desired part of the boat, within range of the apparatus. But not only was such movable conduit's discharge pipe handled by the boom on the elevator, but where the change of the tide or the lower level of the ship, caused by loading, made it desirable, a second or supplemental hopper and an additional spout were suspended from and handled by a boom and tackle on the ship itself. This supplemental hopper received the discharge from the elevator spout, and discharged it into the vessel as change of tide or the settling of the vessel necessitated. The proofs further show that where two ships were lying side by side and it was desired to spout the grain to an outlying, or "second-off" one, it was done by such elevator appliances in spite of the long stretch required. It was also a common practice to provide the spout with a telescopic extension end by which further horizontal reach was effected, due to the varying positions of the ship. Moreover, it will be noted that on such apparatus the function of the boom was not only to raise, lower and swing the spout to reach the hatches of the ship under different conditions of load and tide, but also to draw up and house the spout so as

not to interfere with the navigation or movement of the vessel.

The same general type of grain elevator appliance was used for loading cars. The proof is that "the hopper ends of the spouts were constructed with an enlargement, forming hoppers, and grain spouts were connected to them in the elevators. * * * All types of movable and fixed spouts were used in grain elevators at that time, of the movable type, those in the grain elevators were either portable or so constructed that they revolved around a fixed point. * * * Outside of the buildings they had spouts for shipping grain to cars, which were generally fixed in position with a telescope and either with one opening or two, so arranged that grain could be thrown into either end of the car." Without further statement, it will be seen that the steps of lifting grain to get gravity; of storing to get quantity; or chuting to get delivery; and of boom swing and trough shift to vary locality of delivery; and also of duplication of these shore appliances by supplemental boom and conduit on shipboard; had all been advanced to a high state of efficiency and delivery point variation in elevator grain practice.

The same may be said of coal practice, the proofs showing the contemporaneous use of "coal chutes in connection with coal elevators in stock piles, where the coal was elevated and spouted out through the side of the building into a stock pile and into bins. The spout would be supported in a similar manner to the spouts heretofore referred to as shipping spouts in connection with grain elevators," this, "that the spout could swing in any direction and was suspended from a swinging boom."

Later, when concrete docks, piers and the like came to be built, it was quite natural for contractors to use in building them the apparatus used for grain chuting and to handle and chute concrete in the same way. And such

the proofs show, was the case as will be seen by reference to but one or two operations. In November, 1906, a concrete foundation for an intake and pumping station was built by the Great Lakes Dredge and Dock Company at Gary, Indiana. Here a car was used on which was a mixer from which the concrete was discharged into a hopper or chamber and from which chutes suspended from a boom located on the car, chuted the mixed concrete down to the coffer dam where it flowed either into piles or was poured in place, the dam being some forty feet in width and of great length. The chutes in the apparatus would be moved up, down and sideways. The apparatus was used for several months and was constructed by a man who had never seen concrete so handled, but had seen it used in grain elevators. In addition to the testimony of the builder of this apparatus, another witness testified as follows:

> "The first apparatus we used was a concrete mixer set on a flat car, and the concrete was spouted from the mixer into the bottom of the excavation. We called it chutes then. There was an improvement made on this apparatus to distribute the concrete from one location to another within a radius controlled by a boom holding the chutes or spouts. The ends of the spouts were—the location of the ends of the spouts were placed by swinging the boom that carried the concrete spouts."

The same man the next year used similar apparatus in building a concrete dock at the same place. In this case the apparatus was placed on a scow, a mast being placed in front of a mixer, a boom placed on such mast and a chute suspended by tackle therefrom. As to its mode of operation the constructor testified:

> "It is dumped out of the mixer into a bucket, and conveyed up with a cable in a bucket, and dumped into a hopper which is fastened on the tower; and

we have one 50 foot section of 12-inch pipe carried by two booms and fastened on the bottom of the hopper, and as occasion requires placing concrete in forms, we have 8-foot sections or 10-foot sections to take on or off.

"Q. How could you change the point of delivery of the lower end of the pipe?

"A. By adding on a section 10 feet long, or taking it off, as occasion required.

"Q. Was there any other way to change the point of delivery?

"A. By swinging booms and swinging pipe.

"Q. Was this apparatus successful?

"A. Very successful."

Another witness described it thus:

"This apparatus is a concrete equipment built on a scow, consisting of a concrete mixer at the proper elevation so that concrete could be spouted into the concrete dock; and above the mixer was constructed two hoppers, one for stone and one for sand, this being at one end and the other end of the scow being the cement shed. A boom was placed to support the chute, for the purpose of raising the spout so that the concrete equipment could be moved—I meant to state for the purpose of spouting the concrete in the forms for the dock, and also to raise the spout when moving the equipment ahead."

He further testified that the number of chute sections used was determined by the distance from the mixer to the concrete forms and that as much as five or six such sections were used on this work and that the dock itself was five thousand feet long.

There is proof of the use at San Francisco Harbor in 1904-5-6 of substantially similar concrete chuting apparatus placed on a scow. It clearly shows the use of chutes moved to different positions by a boom. A witness thus describing the boom's action, said:

> "Well, the boom is the bottom end of it, and sets in a hinged socket, I would call it, and the outer end has a sheave in the end of it, the cable runs from the donkey engine to the sheave in the outer end, which is used to handle the pipe that carries the cement to the cylinders. All the use of this boom is to handle the pipe that carries the cement."

Moreover, a study of the proofs satisfy us that from the time concrete came into use there had been a struggle between the architects and designers, who, as a class, favored the use of dry concrete which would not flow, and the contractors, who, for construction convenience favored wet or mush concrete, which would flow and therefore allow the use of distribution chutes, and that as soon as the use of wet concrete became general, the art used the wet concrete chutes, which it could not use for the dry. In that regard, the proof was that "The more reinforced concrete came into use, the more contractors used wet concrete; and I should say that from 1908 on on very much the greater portion of reconstruction work was done in concrete than before; hence, also, the more wet concrete was used since that time." In these evolutionary stages of the concrete art, the proof is that the builders of grain elevators took a leading part in the use and distribution of wet or mush concrete. In that regard, the proof is:

> "Architects in general prior to the year 1904-05 demanded that concrete be mixed what is known as very dry; and to such a consistency that it required considerable tamping to make the water flow on top; but grain elevator designers and contractors have never been governed by architects' rules and guidance or specifications, as the elevator designer generally built the elevator that he designed, or that some other company designed; therefore they were a sort of law to themselves, and, in my opinion, were the first designing engi-

neers and contractors to use what is known in the trade as 'wet' or 'sloppy' concrete. In my opinion this was brought about by the use of what is called 'slip' or 'movable' forms. By the use of such form, which is usually about 4 feet high, the wall, column, or girders, is formed by filling the movable form with sloppy concrete and reinforcing, and at the same time, constantly raising the form by a series of jack screws supported on steel bars, which are imbedded in the concrete. The jack screws are fastened into these bars, and by turning down the jack screws the form is forced up; this making the structure one monolithic mass; but to do this the concrete had to be run into the form in a liquid state, and such a liquid state that it did not require tamping, but only spading.

* * * * * * * *

"From the mixer the concrete was spouted into a hoist hopper. This hoist hopper was hoisted by a power to the top of the building as it was in course of construction. When reaching the top a gate, which was provided on the side of the first hopper, was opened and the concrete material allowed to discharge through a spout into another similar hopper, but stationary. This last named hopper was usually located about from 15 to 20 feet away from the side of the hoist tower, and in the elevator work was supported on the movable form. From this hopper the concrete was drawn into wheelbarrows or concrete carts, and with these distributed into the various walls, columns and floors."

An engineering witness described the evolution and growing use of wet concrete in this way:

"About 1902, there was considerable agitation among engineers of all kinds dealing with foundations, as to wet or dry concrete. The engineering fraternity was divided into two camps about that time, one advocating a concrete mixed quite dry and thoroughly tamped, and the other advocating

using a concrete mixed quite wet or mixed to a consistency which would enable it to flow easily, and which did not require tamping after being placed. This agitation to my knowledge, extended over a period of about five years, the wet fellows arguing that from a constructional standpoint the concrete was easier and more cheaply placed and made a more dense mixture. About this time, also, 1902, I joined the Western Society of Engineers and attended the meetings quite frequently, and heard papers read by different engineers on both sides of the question. The use of reinforcing steel in concrete became more customary about 1902, and a former professor of civil engineering of the University of Illinois, Prof. Pence, read a paper before the Western Society of Engineers, describing tests he had made as to the expansion coefficient of concrete, with relation to the expansion of steels.

* * * * * * * *

"These experiments brought out the fact that it was possible to use steel and concrete together, so far as the expansion coefficient was concerned, and following this with the increased use of reinforcing steel in concrete it was almost imperative that a wet concrete be used in order to have it properly placed around reinforcing steel. Really, according to my opinion, the introduction of reinforcing steel made it imperative that concrete more of a consistency of liquid be used in order to build the structures then being designed, and this fact made it imperative that in handling this liquid concrete the chute or trough come into play."

Sensing the gradual increased use of the concrete art through these experimental years, it would seem from the proofs that the grain elevator contractors led the way in the broader use of mobile concrete and that as the engineer determined the co-efficient of relative expansion of steel and concrete was such as to permit their joint use

in reinforced building construction generally, the consequent and indeed the insistent call for the use of wet or fluid concrete became more imperative, because such concrete could be better placed around reinforcing steel and that this use of fluid concrete naturally brought with it the employment of fluid carrying troughs.

This insistent call for wet concrete was evidenced by the building requirements made by the City of San Francisco after the earthquake and fire catastrophe. In that regard an experienced engineer who went there from the East to study building conditions testified:

> "There are so many different types of buildings in old San Francisco, but, roughly, the most decided change, I believe, was the general adoption of more concrete in the construction of the new buildings. As a rule concrete was substituted for former brick and tile construction wherever possible. Shortly after the earthquake two types of buildings were officially recognized by San Francisco, and generally through California, *i. e.*, class A type, which consisted of a steel frame fireproofed by concrete; and class B building, which consisted almost entirely of reinforced concrete. This necessitated the more general use of wetter concrete than had been practiced heretofore, as walls and floors and fireproofing were of the minimum thickness allowed by safety, and could not be constructed with the older methods of dry concrete."

It is no reflection on the patent office of the United States, but simply an instance of how often the theoretical expert of an art is in his office oblivious to the atmosphere of practical accomplishment in the field of achievement, when we note that, unconscious of this wide, growing and much discussed use of wet cement, the patent office, on November 2, 1909, granted Patent No. 939,072 to A. D. Ney, which was based on the specification statement by him made July 10, 1909, that "In the making of concrete,

it has hitherto been the general practice in mixing the materials as stiff as possible, using only sufficient water to cause the adherence of the material together, and thereafter tamping the material to cause the mass to be as compact as possible in its relatively dry condition. In the operation of making the product of the present invention, a *radically different method is followed in that an abundance of water is employed* in order not only to permit gravity to bring the mass to a solid, compact condition and thereby dispense with the ramming operation, but also to provide sufficient water for the purpose of crystallization. The process of forming the present process is essentially *a wet process,* and distinguished from the relatively *dry process employed* in making concrete."

In the actual state of the working art which the proofs quoted above show in fact existed, and with the measure of the art, as evidenced by the Nay patent above quoted, then held by the patent office, Callahan and a number of other alleged inventors, who thereafter were thrown into interference with each other, applied for patents which had in view the spouting or chuting of wet concrete. Without attempting to settle the questions of priority between these claimants, we may say that the period which embraces their several dates is confined to a comparatively narrow compass and to our mind they all serve to show that at or about the same time the natural mechanical evolution of the concrete art and the possibility of the use of wet concrete mechanically, but instinctively, led all these men to adopt the same general types of mechanical appliances for the chuting of wet concrete. It is a situation to which we feel we may re-apply what was said by this court in *Elliott* v. *Youngstown,* 181 Fed. Rep., 349:

"Nor is it necessary to dwell upon the suggestion

> that applications were made for blue print machines with an automatic cut-off by four different inventors about the same time, Fullman and Herman among the rest. The fact that so many persons caught the idea goes rather to prove that it was simple and obvious, and not that it required inventive genius to conceive. It is not like the case where the art is waiting for the device, and inventors striving unsuccessfully to produce it, under which circumstances invention may well be held to appear."

Restricting ourselves therefore to the single one of these group inventors, we note that on January 21, 1909, Lee Callahan applied for, and on February 8, 1910, was granted Patent No. 948,719, here in suit, for a material transferring apparatus. As stated in the specification, Callahan's alleged invention had "for its general object to provide an apparatus calculated to be used to advantage in transferring concrete or other plastic material from a suitable source of supply to points desired on a building that is being built." It also stated a second general purpose was "to provide an apparatus of the kind stated adapted more especially for use when a building is to embody reinforced concrete." And likewise a third, viz.: "for transferring other material from the ground to the points desired on a building in course of construction." On his apparatus, Callahan was allowed the claims here in question, viz.: 1, 2, 5 and 13, of which the first reads:

> "An apparatus for the purpose described, comprising a tower, a suitably supported horizontally movable boom connected therewith, a conduit carried by the boom, means for raising plastic material to a suitable point in the height of the tower, and means for receiving plastic material from said raising means and conducting the same to said conduit."

This is fairly illustrative of the elements of the other three claims. The elements of the quoted claim are first "a tower"; second, "a suitably supported horizontally movable boom connected therewith"; third, "a conduit carried by the boom"; fourth, "means for raising plastic material to a suitable point in the height of the tower," and, fifth, "means for receiving plastic material from said raising means and conducting the same to said conduit."

Comparison of Callahan's apparatus with the prior art shows that it really constituted no advance over that art, but on the contrary, rather a step backward. For example, he either had no knowledge of the use of the open trough or chute, or if he had he made no mention of it or suggestion of its possible use, confining his specification and limiting his claims to "a conduit" or closed pipe. And the proof is that this closed conduit of his claim soon proved worthless on account of clogging and had to be supplanted by the open chute of the earlier art. There was of course nothing new in his element of his elevating tower. That was as old as the elevator art. Making it extensible from story to story involved no more invention than if he had built his tower complete at the start and allowed his building to build up to tower height instead of the tower to the building height. His means to convey the material up the tower was only another name for an elevator cage or container of suitable form and capacity. A receptacle for storage at the top was a common practice in grain and coal devices and a boom to carry a chute or trough was common in the grain and concrete arts. In fact, we are unable to find any element of novelty either in the separate elements Callahan used or in the unification of such elements in the apparatus he suggested. Had the actual state of the prior art been shown to the patent authorities we cannot feel they would

have granted this patent and while we feel embarrassed to find ourselves at variance with the Circuit Court of Appeals of the Sixth Circuit, which in the case of *Concrete Appliances Co., et al.* v. *Meinken* et al., 262 Fed. 958, found this patent valid, we feel assured that the meager record before that court wholly failed to disclose the now uncontradicted proofs on which we base our conclusions.

In the advance in the concrete building art with the extension towers to great heights and chutes to great distances, the very magnitude and scale of the work are such as to impress the onlooker and there is danger of one's being misled by their very magnitude into the belief that they must involve invention, but when their principle is sensed it will be found the known principle and practice which marked the art long before this patent, have simply enlarged as construction enlarged its operation. That growth is in this case due to the appreciation of wet concrete and convinced as we are that in roads, piers, docks, bridges and buildings generally, concrete is the growing material of the future, we believe its advance should be in no way embarrassed by this patent by which the art is now sought to be blanketed. The court below held the patent was not infringed; we go a step further and hold Callahan, so far as the claims here involved are concerned, had no such patent claims to infringe. The cause will therefore be remanded to the court below to modify its decree by adjudging the claims in controversy invalid and as thus modified the decree is affirmed.

APPENDIX C.

IN THE

UNITED STATES CIRCUIT COURT OF APPEALS
FOR THE THIRD CIRCUIT.

March Term, 1923.

CONCRETE APPLIANCES COMPANY, *Appellant,* *v.* J. E. GOMERY, *et al.*, *Appellees.*	No. 2982.

Appeal from the District Court of the United States, for the Eastern District of Pennsylvania.

This cause came on to be heard on the transcript of record from the District Court of the United States, for the Eastern District of Pennsylvania, and was argued by counsel.

On consideration whereof, it is now here ordered, adjudged and decreed by this court, that the decree of the said District Court in this cause be, and the same is hereby modified so as to adjudge the claims in controversy invalid, but otherwise affirmed, with costs.

Philadelphia.
July 24, 1923.

(sgd.) VICTOR B. WOOLLEY,
Circuit Judge.

On an application with respect to costs seasonably made within the term of the decree, the above order is vacated.

(sgd.) VICTOR B. WOOLLEY,
Circuit Judge.

Received and Filed
Jan. 23, 1924.
SAUNDERS LEWIS, JR.,
Clerk.

APPENDIX D.

IN THE
UNITED STATES CIRCUIT COURT OF APPEALS
FOR THE THIRD CIRCUIT.

March Term, 1923.

No. 2982.

CONCRETE APPLIANCES COMPANY AND WILLIAM H. INSLEY,
Appellants,

v.

JOHN E. GOMERY, JOHN C. SCHWARTZ, MICHAEL J. O'MEARA,
AND CONCRETE CONSTRUCTION COMPANY,
Appellees.

Having heard and considered the application of the appellants that the costs in this cause, taxable against them, be limited to such as were actually paid by the defendant users of the alleged invention of the patent; and being of opinion that the manufacturer which supplied the defendants with the alleged infringing appliances and openly defrayed in part the expenses of this litigation are to that extent privy to the action.

IT IS on this thirty-first day of January, 1924,

ORDERED, adjudged and decreed that this cause be remanded to the District Court of the United States for the Eastern District of Pennsylvania, that the said court modify its decree by adjudging the claims in controversy invalid, and as thus modified the decree is affirmed, with costs to the appellees covering their proper disbursements as users and the proper disbursements of the manufacturers supplying them with the alleged infringing appliances.

VICTOR B. WOOLLEY,
Circuit Judge.

IN THE

SUPREME COURT OF THE UNITED STATES

OCTOBER TERM, 1923.

No. ——.

CONCRETE APPLIANCES COMPANY AND WILLIAM H. INSLEY,
Petitioners,

vs.

JOHN E. GOMERY, JOHN C. SCHWARTZ, MICHAEL J. O'MEARA AND CONCRETE CONSTRUCTION COMPANY,
Respondents.

BRIEF OF RESPONDENT IN OPPOSITION TO PETITION AND BRIEF FOR WRIT OF CERTIORARI TO THE COURT OF APPEALS FOR THE THIRD CIRCUIT.

There is no real conflict between the decisions of the Third Circuit Court of Appeals and of the Sixth Circuit Court of Appeals, and, therefore, there is no proper basis for a writ of certiorari.

It is true that the Sixth Circuit Court of Appeals, in January, 1920, held that the claims in question were valid, on the *very meager record* before it at that time. It is also true that the Third Circuit Court of Appeals

held these same claims invalid in July, 1923, in view of the very lengthy and *detailed history of the practical development of the art* then before it. However, the records in the two cases were so different that the issues before the Court in each case were likewise *entirely different.*

This difference was recognized by the Third Circuit Court of Appeals at the time it rendered its opinion and can be emphasized no better than to quote from said opinion.

> **"Had the actual state of the prior art been shown to the patent authorities we cannot feel they would have granted this patent and while we feel embarrassed to find ourselves at variance with the Circuit Court of Appeals of the Sixth Circuit, which in the case of Concrete Appliances Co. et al., v. Meinken et al., 262 Fed., 958, found this patent valid, we feel assured that the meager record before that court wholly failed to disclose the uncontradicted proofs on which we base our conclusions."**

The Cincinnati Court had before it only a "paper" showing consisting of a few patents with no testimony whatever as to the practical development of the art or of prior uses.

The Philadelphia Court had before it a complete history of the practical development of the art reinforced by over sixty exhibits, other than patents.

The defendants, in the earlier case, in the Sixth Circuit Court had only one witness, Wm. H. Insley, who was one of the *plaintiffs* in that suit and in the present suit. Defendant's entire proofs will be found in the three and one-half pages, beginning with page 32 of the Court of Appeals' Record in the Cincinnati case.

The defendants, in the later case, in the Third Circuit Court had over fifty witnesses. The testimony of forty of these witnesses was taken by depositions, the testi-

mony of ten was stipulated and two were called in open court.

The Callahan patent in suit, No. 948,719, issued February 8th, 1910, on an application filed January 21st, 1909. The District Court in Cincinnati held the claims invalid, on the record before it. The Court of Appeals held said claims valid.

The District Court in Philadelphia held the claims valid but not infringed, intimating, however, that on the record before it said claims would have been held invalid but for said earlier decision of the Sixth Circuit Court of Appeals, which said District Court felt bound to follow. The Third Circuit Court of Appeals held the same claims invalid in view of the new showing presented.

In the Third Circuit, many prior uses were proved of apparatus so analogous to that of the patent in suit as to present an entirely different basis for determining the question of invention, entirely aside from the question of novelty. There was also presented testimony and photographs clearly establishing the prior use in St. Louis in 1908 of the exact combination of elements claimed. Such a showing is in strong contrast to the record in Cincinnati which was entirely devoid of prior uses. In fact, anticipation was not even alleged, much less proved. The Court in that circuit held:

> **"It is not contended that the patent is anticipated, in the strict sense of that term. . . ."**

The Court also held that certain of the main defenses

> **"entirely lack the only substantial novelty claimed for Callahan."**

This lack was abundantly supplied in the Philadelphia case.

The Court also said:

> "On the other hand, it impresses us as a **bold**

> **and original** thought that this material could be handled in this way. Distributing mush concrete through gravity chutes by one apparatus throughout the whole course of building obviously involved difficulties; it had **never been handled by gravity chutes at all** excepting under simple conditions where these difficulties did not exist,—and then, perhaps, had been done **only on paper;**"

Further:

> "The quasi-automatic elevation and distribution of wet concrete under the varying conditions of progressive building and by a single apparatus was **an entire novelty.** No one had tried to do it; apparently, **no one had thought of it;** it was useful in a very high degree; and when we find a new result in this complete and extreme sense accomplished by a confessedly new combination,—though of known means,—we think both the purpose of the patent law and the rightful application of the decisions thereunder require that it should be awarded the merit of invention." (Emphasis ours.)

The record before the Philadelphia Court was replete with instances wherein mush concrete had been handled in this way not only *on paper* but as an *actual fact.* Where the meager record before the Court in Cincinnati justified the inference that Callahan's handling of material this way was "a bold and original thought," the record before the Court in Philadelphia showed that so much had been known by others and so much had been practiced by others in this same field that Callahan's alleged invention was no advance in the art at all and that his making application for a patent was due to his unfamiliarity with practices which, in many quarters, were matters of common knowledge. This situation is forcefully expressed by the Third Circuit Court of Appeals in the following words:

> "Comparison of Callahan's apparatus with the prior art shows that it really constituted **no ad-**

> **vance** over that art, **but on the contrary, rather a step backward.** For example, he either had **no knowledge of the use of the open trough or chute,** or if he had made no mention of it or suggestion of its possible use, confining his specification and limiting his claims to 'a conduit' or closed pipe. And the proof is that this closed conduit of his claim soon proved worthless on account of clogging and had to be supplanted by the open chute of the earlier art." (Emphasis ours.)

There was no proof before the Court of Appeals of the Sixth Circuit as to the actual early work of Callahan, or as to the actual practical work of anyone else, as previously stated, whereas the opinion just quoted was based on a full showing of Callahan's early work in California, which was before the Third Circuit Court of Appeals.

The record before the Third Circuit Court of Appeals comprises nearly a thousand printed pages of testimony relating to the early use of apparatus for distributing mush concrete and illustrating the development of the art up to and somewhat beyond the date of the patent in suit February 8th, 1910. The outstanding structures and developments are as follows:

The Ingalls Building, built in 1902, in Cincinnati. (Also illustrated in the Engineering News of January 30, 1903.)

The Lynnhaven Hotel, built in Norfolk, Va., in 1906.

American Theatre Building, St. Louis, 1907.

Coliseum Building, St. Louis, 1908.

Tootle-Campbell Building, St. Joseph, Missouri, 1908.

Sumner High School, St. Louis, 1908.

Franklin School, St. Louis, 1909.

Operations of Healy-Tibbets Co. in San Francis-

co, for a period of several years following the earthquake and fire in 1906, in the rebuilding of docks and piers along the water front.

Majestic Theatre Building, Los Angeles, 1908.

Operations of the Great Lakes Dredge and Dock Co. in connection with the building of the plant of the U. S. Steel Co. at Gary, Indiana, beginning in 1906, and covering a period of years.

Construction of various grain elevators in different parts of the country, including Portland, Maine, and New Orleans, at least as early as 1905.

Testimony of several engineers regarding early use of grain spouting equipment, apparatus similar to which was used later for spouting concrete.

Testimony regarding construction of Webber Dam, Lyons, Michigan, in 1906, showing actual use of grain spouting apparatus for distributing mush concrete, showing the tying together of the grain distributing art and the concrete distributing art, long prior to the patent in suit.

Testimony to show that the most important of the St. Louis uses were admittedly well known to the plaintiffs at the time of the Cincinnati suit, but were apparently unknown to the defendants in that suit, or in any case, were not brought into the record, as that they were not before that Court. They were presented for the first time to the Third Circuit Court of Appeals.

Track elevation work in Chicago beginning in 1903, involving concrete distributing apparatus employing a swinging boom.

Prior publications other than patents including various copies of the Engineering News and the Engineering Record prior to the date of the patent in suit; a number of text books; excerpts from the

Transactions of the American Society of Civil Engineers; and certain early catalogues.

Testimony of each of the three parties involved in an interference which included Callahan's application forming the basis of the patent in suit.

The testimony of an engineer regarding building practices in San Francisco developed as a result of the earthquake and fire and its relation to the *natural evolution* in the art which lead to the general adoption of apparatus of the character in suit, independently of any contribution by the patentee, Callahan.

Testimony showing that the apparatus complained of as an infringement in the Third Circuit was materially different from the apparatus complained of in the Sixth Circuit.

Testimony as to lack of public acquiescence.

None of the foregoing defenses was before the Sixth Circuit Court of Appeals in the earlier suit and the contention of the petitioners that the prior uses referred to in the decisions of the Court of Appeals for the Third Circuit were of apparatus "substantially the same as that of the prior patents found in the record in the Sixth Circuit," is inaccurate and misleading, as only a few of the patents in question were related to uses brought out in the later testimony, and in the only instance of importance (the Smith patent, which was also involved in the Cincinnati suit and was held invalid) the date of the patent was *not early enough* to constitute an anticipation of the Callahan patent, whereas the *use* of the apparatus, on which the patent was based, *was early enough* and was proved for the first time in the Philadelphia suit. Many of the other patents related to what might be called "freak" apparatus which, as far as known, never went into general use, whereas most of the testi-

mony in the record in the Third Circuit related directly to actual uses, reinforced by blue-prints, photographs and other data.

The contention that the Court of Appeals for the Third Circuit did not base its decision on the same claim as the Court of Appeals for the Sixth Circuit is only superficially true, as both courts considered all the claims, but selected different ones as convenient illustrations of the principles discussed in their decisions. The Third Circuit Court of Appeals said that claim 1 "is fairly illustrative of the elements of the other three claims." The Sixth Circuit Court of Appeals stated that claim 5 "may be accepted as a statement of his invention said to be infringed."

The statement of petitioners on page 6 of their brief that the prior uses presented for the first time to the Third Circuit Court of Appeals "were not uses of the complete apparatus of the claims" must be challenged, as among such uses is the apparatus employed in building the St. Louis Coliseum in the summer of 1908, a photograph of which, Defendants' Exhibit 22, shows the complete combination of the five elements claimed. On the next page of said brief, petitioners allege that two elements of the combination were lacking in the prior art considered by the Third Circuit Court of Appeals in its discussion of claim 5, viz: the boom carrying a conduit and the vertical adjustability of the bin. Both of these features, however, are clearly shown in the St. Louis Coliseum apparatus and are described by witnesses. Furthermore, on page 10 of said brief, the statement is made "In both Courts the particular entire combination of elements was not found in the prior art." This assertion completely ignores Exhibit 22 and the other undisputed showing made as to the existence and

use of the combination of the same five elements during the erection of the St. Louis Coliseum in the summer of 1908.

By way of summary, the Sixth Circuit Court of Appeals had nothing before it to show that the claims in suit were anticipated, and in view of the "paper" showing made, of material handling apparatus in somewhat different arts, did not feel justified in ruling that the claims in suit did not involve invention, but on the contrary, ruled that the claims were valid. The Third Circuit Court of Appeals at a later date had presented to it a complete anticipation of the combination claimed and a full and complete showing of the entire practical development of the art and of related arts, in view of which latter there is evidently no invention in the combinations claimed, even in the absence of the complete anticipation referred to.

In addition, the Third Circuit Court of Appeals had before it proof that the Callahan invention was *impractical* and *inoperative* and was not made practical and operative until a considerably later date, and not until the defects in the equipment had been overcome by others. Said Third Circuit Court of Appeals therefore concluded that not only were the claims *invalid,* but also that the apparatus of the Callahan patent was a *step backward* in the art. These conclusions having been based on an entirely different presentation of facts from that before the Sixth Circuit Court of Appeals, there is no real conflict in the decisions. The same record, if presented to the Sixth Circuit Court of Appeals or Court of Appeals in any of the other remaining circuits would, as intimated in the decision of the Third Circuit Court of Appeals, compel the same conclusion reached by it.

In view of the foregoing, it is respectfully submitted that the petition for writ of certiorari in this case should be denied.

GEORGE BAYARD JONES,
THOMAS F. SHERIDAN,
WILLIAM STEELL JACKSON,
Counsel for Respondents.

INDEX.

Statement of the case 4
Outline of respondents' argument 5
Argument 6
The patent in suit 8
Defendants' apparatus 11
History of Callahan patent 12
(A) Interferences in the Patent Office 12
(B) Suits elsewhere based on this patent 14
(C) The present suit in the Third Circuit 15
First defense—The claims in suit are invalid 16
(A) Same combination of five elements, or their equivalents, was in use before the date of Callahan's alleged invention, for distributing not only concrete, but grain, coal and other materials 16
Ingalls Building, Cincinnati, Ohio, 1902 16
Lynnhaven Hotel, Norfolk, Va., 1906 20
St. Louis Coliseum Building, July-October, 1908 30
American Theater Building, St. Louis, Mo., 1907 36
Tootle-Campbell Building, St. Joseph, Mo., 1908 50
Sumner High School, St. Louis, July, 1908 51
Franklin School, St. Louis, 1909 52
Webber Dam, near Lyons, Mich., 1906 54
Great Lakes Dredge & Dock Company Apparatus, developed beginning 1906, at Garry, Ind. 56
Track elevation 69
Grain elevators—Deposition of Wm. R. Sinks 70
Grain elevators—Deposition of R. H. Folwell 73
Grain elevators—Deposition of L. A. Stinson 76
Grain elevators—Deposition of C. T. Anderson 79
Prior patents 80
Prior publications other than patents 83
Majestic Theater Building, Los Angeles, 1908 87

Healy-Tibbetts Company's Apparatus, San Francisco, 1906-1909 122
(B) The claims in suit do not cover patentable combinations, but mere aggregations of several elements 134
(C) Combination claimed does not represent invention, but a natural evolution in the art..... 137
(D) The claims in suit represent a mere double use of apparatus previously used for many years for distributing other material..... 143
(E) The Callahan apparatus was impractical and inoperative until its inherent difficulties were overcome by changes made by others..... 151
Second defense—The claims are not infringed..... 156
Third defense—No public acquiescence..... 170
Fourth defense—The decision of the Court of Appeals for the Third Circuit should be followed, rather than that of the Sixth Circuit..... 172
Fifth defense—The plaintiffs are not entitled to equitable relief 174
Other decisions of interest..... 177
Costs 178
Conclusion 181

Index of Citations.

Appleton Manuf'g. Co. *v.* Star Manuf'g. Co., 60 Fed. 411 35
Barbed Wire Case, 143 U. S. 275..... 101
Brooks *et al. v.* Sacks, 81 Fed. 403..... 35
Busell Trimmer Company *et al. v.* Frank Stevens *et al.*, 34 U. S. 423..... 136
Clark Thread Co. *v.* Willimantic Linen Co. *et al.* 140 U. S. 481 .....35, 90
Crone *v.* John J. Gibson Co., 237 Fed. 637..... 35
County of Fond du Lac *v.* Sarah May, 34 U. S. 395.... 136
Dodge Coal Storage Co. *v.* N. Y. Cent. & H. R. R. Co., 150 Fed. 738 .....147, 178
Dunbar *et al. v.* Eastern Elevating Co. *et al.*, 81 Fed. 201 150
Eames *v.* Godfrey, 68 U. S. 78..... 160
Eck *v.* Kutz, 132 Fed. 758..... 168
Edward Barr Co. *v.* New York & New Haven Automatic Sprinkler Co., 32 Fed. 79..... 169
Elliott *v.* Youngstown Co., 181 Fed. 345.....140, 167
Holmes Electric Protective Co. *v.* Metropolitan Burglar Alarm Co., 33 Fed. 254..... 149
Houser *et al. v.* Starr, 203 Fed. 264..... 149
James M. Grant *v.* Richard Walter, 148 U. S. 544..... 149
Mallon *et al. v.* Gregg *et. al.*, 137 Fed. 68.....140, 141
Mast, Foos & Company *v.* Stover Manufacturing Co., 177 U. S. 485..... 170
McCaslin *v.* Link Belt Machinery Co. *et al.*, 139 Fed. 393 170
McCaskey Register Co. *v.* Mantz, 224 F. R. 495..... 161
McCaskey Register Co. *v.* Divens, 194 Fed. 967..... 164
New England Motor Co. *v.* B. F. Sturtevant Co., 150 Fed. 131..... 35

Newton *v.* Consolidated Gas Co., 265 U. S. 85; 68 L. Ed. 911 180
New York Scaffolding Co. *v.* Liebel-Binney Construction Co., 254 U. S. 24 177
Pennsylvania Railroad Company *v.* Locomotive Engineering Safety Truck Co., 110 U. S. 490 149
Phoenix Knitting Works *et al. v.* Rich *et al.*, 194 Fed. 722 169
Ransome Concrete Machinery Co. *v.* United Concrete Machinery Co., 177 Fed. 413 148
Reckendorfer *v.* Faber, 92 U. S. 347 136
Richards *v.* Chase Elevator Co., 158 U. S. 299 135
Roberts *v.* Ryer, 91 U. S. 150 151
Rogers *v.* Fitch, 81 Fed. 959 35
Russell Grader Mfg. Co. *v.* Zeig Mfg. Co., 259 F. R. 575 160
Sheffield Car Co. *v.* D'Arcy, 194 Fed. 686 133
Simon Florsheim *et al. v.* Gustav Schilling, 34 U. S. 64 136
Smith & Griggs Mfg. Co. *v.* Delia Sprague, Admr. of Leonard Sprague, deceased, 123 U. S. 249 34
Shelby Steel Tube Co. *v.* Standard Steel Tube Co., 286 Fed. 863 83
St. Paul Plow Works *v.* William Starling, 140 U. S. 404 35
Thomson-Houston Electric Co. *v.* Lorain Steel Co., 117 Fed. 249 178
Thropps' Sons' Co. *v.* Seiberling, 264 U. S. 329; 68 L. Ed. 712 171
Torrey *et al. v.* Hancock, 184 Fed. 61 35
Trussed Concrete Steel Co. *v.* Goldberg *et al.*, 222 Fed. 506 155
Turner *v.* Moore, 211 Fed. 466 132
United States Column Co. *v.* Benham Column Co., 238 Fed. 200 141

United States Column Co. *v.* Benham Column Co., 225 Fed. 55 ..... 141, 178
Warner Instrument Co. *v.* Stewart & Clark Mfg. Co. 185 Fed. 507 147
Webster Loom Co. *v.* Higgins, 4 Ban. & A., 88 34
Weir Frog Co. *v.* Porter, 206 Fed. 670 147
Wilson & Willard Mfg. Co. *v.* Union Tool Co. *et. al.* 249 F. R. 729 161
Westinghouse Electric & Mfg. Co. *v.* Catskill Illuminating & Power Co., 121 Fed. 831 34
Westinghouse Electric & Mfg. Co. *v.* Saranac Lake Elec. Light Co., 108 Fed. 221 35
Western Electric Co. *v.* Williams-Abbott Electric Co. *et al.*, 83 Fed. 842 170

SUPREME COURT OF THE UNITED STATES

OCTOBER TERM, 1924.

No. 307.

CONCRETE APPLIANCES COMPANY AND WILLIAM H. INSLEY,
Petitioners,

vs.

JOHN E. GOMERY, JOHN C. SCHWARTZ, MICHAEL J. O'MEARA, AND CONCRETE CONSTRUCTION COMPANY,
Respondents.

BRIEF FOR RESPONDENTS.

Opponent's petition for a writ of certiorari and brief in support thereof show a superficial conflict based on opposite conclusions reached as to the validity of the claims in question in the two cases in the Court of Appeals in the Sixth Circuit and the Third Circuit, but the two records were so different that said conclusions would necessarily have to be different. In fact, as we shall show later, the court in the Sixth Circuit in the earlier suit was misled by the petitioners in that certain of the prior uses which the defendant in the Third Circuit considered to be the

strongest, were known to the petitioners (plaintiffs) at the time of the suit in the Sixth Circuit, but these important defenses were not brought forward by the earlier defendants, nor was any reference made thereto by plaintiffs, so that the petitioners in the present suit are in the inequitable position of having argued for and obtained a very broad interpretation of their claims in the Sixth Circuit on the basis of a record which they knew was incomplete and therefore a false presentation of the facts, a situation which came to light for the first time in the suit in the Third Circuit.

In the earlier case, defendants' record contained the testimony of only one witness, and he was one of the plaintiffs at the time. The defense was based almost entirely on patents, with no suitable background of testimony to explain their degree of success or failure in practice. On the other hand, the defendants, in the later case in the Third Circuit, had over fifty witnesses who gave a full history of the development of the practical art.

In the first suit, defendants' entire proofs will be found in the three and a half pages, beginning with page 32 of the Court of Appeals record, in the Cincinnati case. This printed record is before the court as a joint physical exhibit.

In the second suit, in Philadelphia, the record comprised nearly one thousand pages of printed testimony, relating to the early use of apparatus for distributing wet concrete and illustrating the development of the art up to and somewhat beyond the date of the Callahan patent in suit, February 8, 1910.

This record also included many prior publications other than patents, including various copies of the Engineering News and the Engineering Record, prior to the date of the patent in suit, a number of text books, excerpts from the Transactions of the American Society

of Civil Engineers and certain early catalogs, in addition to a number of patents, many of which latter, it is true, were the same as those set up in the answer in the first suit. These patents, however, in the second suit have a different bearing on the issues, in view of the testimony given. For example, the Smith patent 948,746, representing one of the best defenses developed in the second suit, was not filed until after the Callahan patent in suit was filed, and therefore was not a reference against Callahan, as Judge Denison held in the opening statement of his opinion (262 F. R. 960). However, in the later Philadelphia suit, the precise Smith apparatus on which the Smith patent was based, was shown beyond a reasonable doubt to have been used in St. Louis in the summer of 1908, thus establishing an actual use of the invention about five months earlier than the filing date of the Callahan patent and shifting the burden of proof to petitioners. This illustrates the manner in which the defenses in the later suit differed materially from the defenses in the first suit, even though some of them were based ostensibly on the same patents.

The differences between the records in the two cases cannot be better emphasized than to quote from the opinion of the Third Circuit Court of Appeals (291 F. R. 492).

> "Had the actual state of the prior art been shown to the patent authorities we cannot feel they would have granted this patent and while we feel embarrassed to find ourselves at variance with the Circuit Court of Appeals of the Sixth Circuit, which in the case of *Concrete Appliances Co. et al.* v. *Meinken et. al.*, 262 Fed. 958, found this patent valid, we feel assured that the meager record before that court wholly failed to disclose the uncontradicted proofs on which we base our conclusions."

Unless petitioners can point out some fundamental

error in the conclusions reached by the Court of Appeals of the Third Circuit, it is evident that the decree of the latter court should be affirmed.

Statement of the Case.

Petitioners' statement of the case is sufficient as to the facts set out, but contains also certain conclusions with which we do not agree. For example, page 4 of their brief states that "There does not appear to be any serious issue as to infringement here." Page 5 of their brief states "The records before the two Courts of Appeals are believed to be substantially the same so far as they relate to the question of aggregation or invention." On page 6, we find "these prior uses are thought to be substantially uses of the apparatus shown in the prior patents which were considered by that Court" (Sixth Circuit). The following is found on page 7:

> "The conflict therefore appears to be one of decisions based upon substantially the same facts, or at least facts which have substantially the same relation to the questions decided."

We do not concur in any of these views, but as a knowledge of the record is required for a complete understanding of our position, and as we have discussed these points in the main part of our brief, we defer argument thereon.

Outline of Respondents' Argument.

The patent in suit. Claims analyzed and illustrated.

Defendants' apparatus. Three types described and illustrated.

History of Callahan patent:

(A) Interferences in the Patent Office.

(B) Suits elsewhere based on this patent.

(C) The present suit in the Third Circuit.

The claims are invalid:

A. They are anticipated; the same combination of five elements or their equivalents having been used before the date of Callahan's alleged invention, for distributing not only concrete, but grain, coal, and other materials.

B. The claims do not cover patentable combinations, but mere aggregations of the several elements.

C. The combination claimed does not represent invention but a natural evolution in the art.

D. The claims represent a mere double use of apparatus previously used for many years for distributing other material.

E. The Callahan apparatus was impractical and inoperative until its inherent difficulties were overcome by changes made by others.

The claims are not infringed:

A. They are not broad pioneer claims, and, if valid at all, are to be narrowly construed:

I. Because of the interference proceedings in the Patent Office, in which Callahan conceded priority to another;

II. Because of limitations imposed by the prior art; and

III. Because of plaintiffs' admission in answering defendants' interrogatory.

B. Defendants' apparatus differs from the combination described and claimed. Three types of apparatus are used by defendant.

I. Chute supported by cable, now admitted to be no infringement.

II. Trussed chute with no boom, as a separate element.

III. Trussed chute having lower end supported by inclined prop. The chute in this apparatus, as in the preceding type, is not a "conduit" (a pipe), but an open trough, and it is not "carried by" the boom in the sense intended in the claims, *i. e.*, supported throughout its length.

No public acquiescence. On the contrary, the patent has been openly defied, and a number of suits which were filed have not been pressed to a hearing.

The decision of the Court of Appeals for the Third Circuit should be followed, rather than that of the Sixth Circuit.

The plaintiffs are not entitled to equitable relief, because they have not come into equity with clean hands.

Argument.

The new defenses before the court in the Third Circuit fully upheld respondents' contention that the four claims in suit are invalid.

The "uncontradicted proofs" as Judge Buffington called them in the opinion (R. 940) were so overwhelming that the Callahan patent, which the Sixth Circuit Court of Appeals had been led to believe was the ex-

pression of a "bold and original thought" and "inventive thought of a high order" accompanied by apparatus which "substantially differed from anything which had ever been constructed for any purpose" (262 F. R. 964) was shown to be in fact "rather a step backward" (R. 939) as stated by the Third Circuit Court of Appeals, after an examination of the first full and complete history of the prior art which had ever been presented to a court in any of the half dozen suits in which this patent had been involved since 1910, the year in which it issued and in which the first suit was filed.

For the first time in the life of this patent, petitioners' false pose as the owner and licensee, respectively, of a broad "pioneer patent" has been disclosed through the efforts of the respondents to present a *bona fide* showing of the development of the art. In view of this showing the Third Circuit Court of Appeals stated:

> **"We are unable to find any element of novelty either in the separate elements Callahan used or in the unification of such elements in the apparatus he suggested."** (R. 940.)

In the first case, petitioners misled both the lower and the upper courts in the Sixth Circuit by their silence and profited for several years, as they had profited in the past through the attempted exercise of an unjust monopoly. The facts presented to the Third Circuit Court of Appeals showed that this apparatus should have been available to the public for use throughout its entire development, beginning more than twenty years ago; that petitioners had detailed knowledge of some of the precise prior uses and developments which caused the Third Circuit Court of Appeals to declare the claims invalid and to refer to the alleged monopoly as an attempt to embarrass commercial developments by **"this patent by which the art is now sought to be blanketed"**

(R. 940). Plaintiffs' knowledge of these important defenses was unquestionably established through a number of St. Louis witnesses, who testified in the present case that they had previously testified in an earlier suit in which the same Concrete Appliances Co. was the plaintiff in Vancouver, Canada, No. 3287, defended by another of the present plaintiffs, Insley, before he had become a licensee. Mr. Insley himself was compelled to admit these facts when testifying in open court for plaintiffs (petitioners) in Philadelphia (R. 122, 123). Mr. Insley also admitted that the decision in the Cincinnati case was rather widely advertised. *The admission with reference to his knowledge of the insufficiency of the defenses in the Cincinnati suit was not made until compelled by a direct question from the court,* after which the position in which the plaintiff had placed himself was commented on by the court as follows: "This line of interrogation is based upon the clean hand doctrine of the Courts of Chancery" (R. 124).

The Patent in Suit.

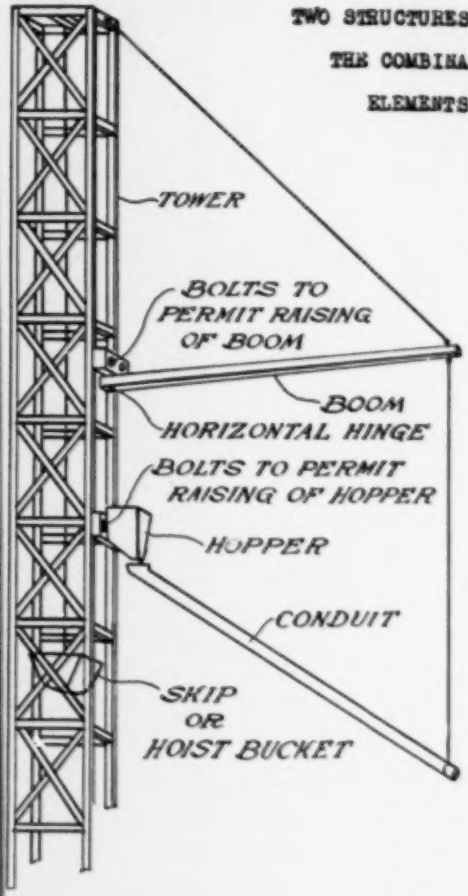
The patent in suit No. 948,719, issued February 8, 1910, to Concrete Appliances Company, on an application of Lee Callahan, filed January 21, 1909.

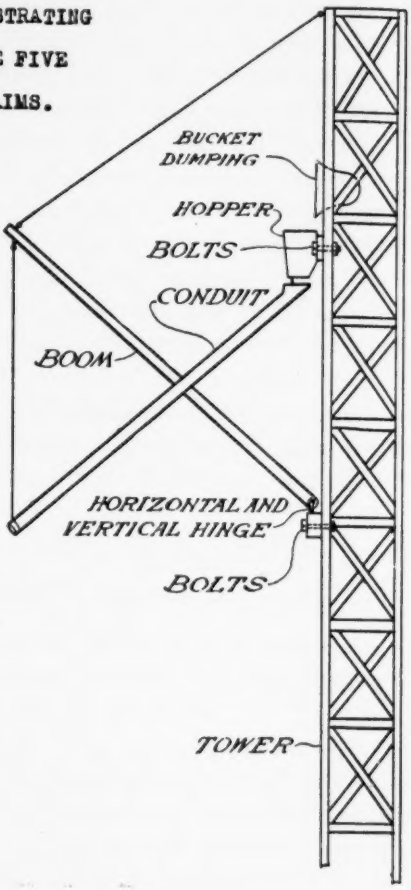
It relates to the elevation and distribution of wet concrete through a pipe or conduit supported by a boom.

Concrete consists of a mixture of crushed stone, sand and cement. The proportions of the three ingredients may be varied, particularly the amount of water used. If very little water is used the concrete is said to be "dry." Such concrete was used almost universally twenty or thirty years ago. It required considerable labor to mix dry concrete.

Most concrete to-day is mixed in power driven rotata-

TWO STRUCTURES EACH ILLUSTRATING THE COMBINATION OF THE FIVE ELEMENTS OF THE CLAIMS.





ble mixers, in which more water is used, such concrete being "wet," that is, of a consistency which will enable it to flow.

The apparatus of the patent in suit was intended to handle wet concrete. After the ingredients are mixed they are discharged into a hoist bucket which is elevated in a tower and automatically dumped into a hopper from which the semi-liquid concrete flows down one or more sections of a conduit supported by a boom, which latter enables the conduit to be swung to different positions. The concrete may flow directly from the conduit into the wooden forms where it hardens, or it may be conveyed to remote parts of the work by hand-pushed carts or wheelbarrows.

Claims 1, 2, 5 and 13 of the patent are in issue. These claims, although differing somewhat in phraseology, cover the same five elements in combination, *i. e.*, (1) a tower, (2) a hoist, (3) a hopper, (4) a boom, and (5) a conduit carried by the boom.

Claim 5, in addition, calls for a vertical adjustment of the conduit and of the boom.

There are twelve other claims in the patent which are not involved in suit. These other claims cover more in detail the five elements referred to, as well as additional elements.

Claim 1, which is fairly typical, reads as follows:

> "An apparatus for the purpose described, comprising a tower, a suitable supported horizontally movable boom connected therewith, a conduit carried by the boom, means for raising plastic material to a suitable point in the height of the tower, and means for receiving plastic material from said raising means and conducting the same to said conduit."

The accompanying drawings will serve to illustrate this combination of five elements, in two different forms, without entering into a discussion of various limitations

which may be imposed either by the wording of the claims or by the prior art. Generally speaking, the apparatus of the drawings, if earlier than the Callahan invention, would be an anticipation, and if later would be an infringement.

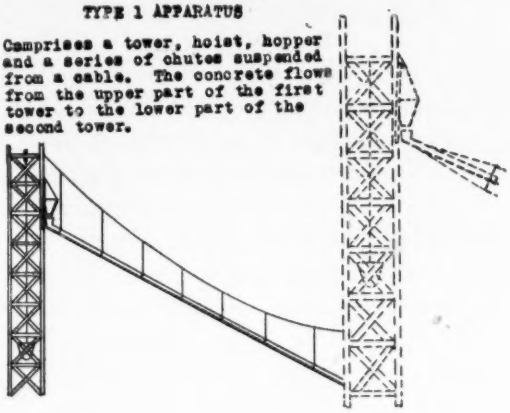
It will be seen from the claim, that the tower may be any tower, either wood or steel. The boom may be a timber or pole, or an open lattice work, and may be either horizontal or on an incline, as long as it can swing from side to side. The conduit may be any ordinary piece of pipe, of no specific length or diameter, and presumably sloping downward at almost any angle, although nothing is said as to such slope. The claim does not specify whether the conduit is above or below the boom, or what the relation is. The means for raising plastic material may be what is commonly known as a skip hoist, or any kind of a hoist either inside or outside of the tower, and the means for receiving plastic material may be any sort of a receptacle or hopper inside or outside of the tower, with its outlet arranged in some manner to discharge the plastic material into the conduit. No swivel connection is claimed.

The foregoing analysis applies to each of the four claims in suit, except that claim No. 5 implies a change from time to time in the location of the hopper and the boom with reference to the height of the tower. As indicated in the drawing, this means merely that the hopper may be unbolted from the tower, raised to a higher point, and again bolted in place; and the seat or support for the lower end of the boom may likewise be raised and bolted in some new position.

Philadelphia, 1920.

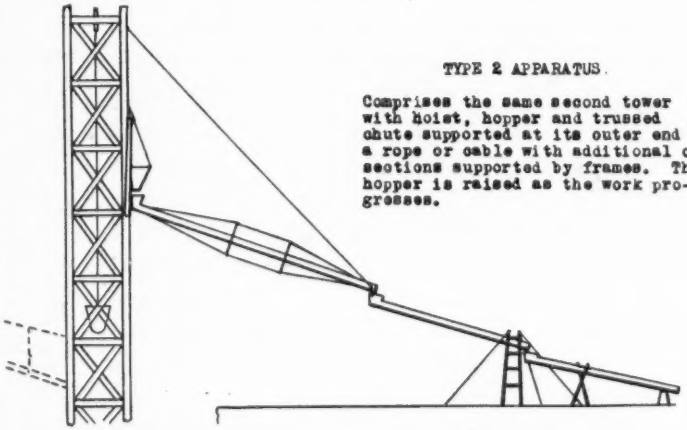
TYPE 1 APPARATUS

Comprises a tower, hoist, hopper and a series of chutes suspended from a cable. The concrete flows from the upper part of the first tower to the lower part of the second tower.



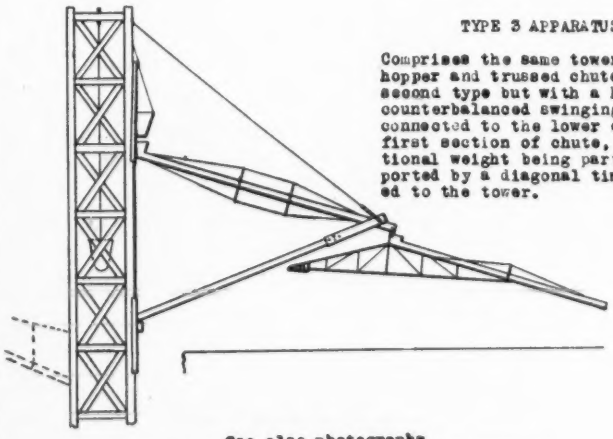
TYPE 2 APPARATUS

Comprises the same second tower with hoist, hopper and trussed chute supported at its outer end by a rope or cable with additional chute sections supported by frames. The hopper is raised as the work progresses.



TYPE 3 APPARATUS

Comprises the same tower, hoist, hopper and trussed chute of the second type but with a heavy counterbalanced swinging chute connected to the lower end of the first section of chute, the additional weight being partially supported by a diagonal timber pivoted to the tower.



See also photographs
Defendants' Exhibits P to M inclusive.

Defendants' Apparatus.

Defendants' concrete distributing apparatus, used in building the Gomery & Schwartz automobile warehouse at Twenty-Fourth and Market Streets, Philadelphia, is shown in the accompanying drawing. It involves three types of apparatus.

The first type comprises a tower, hoist, hopper, and a series of chutes or metal troughs suspended from a cable.

The second type comprises a tower, hoist, hopper, and trussed chute supported at its outer end by a rope or cable, connected to the tower near the top. A second section of chute is connected to the lower end of the first chute section by a swivel connection, the lower end of the second chute being supported on a trestle or horse on the floor. The third section of chute extends from the second chute and rests on braces or horses.

The third type of apparatus comprises the same tower, hopper, hoist, and trussed chute of the second type of apparatus, but with the addition of a heavy counterbalanced swinging chute connected to the lower end of the first section of chute, this additional weight being supported by a timber, extending diagonally upward from the tower to the lower end of the first chute section, and by the cable which supports the upper end of the timber. For purposes of discussion this timber or brace may be called a boom.

As will be explained hereinafter, the building was begun, using apparatus of types 1 and 2, but before it was completed the supplemental equipment was added, and the building was finished using apparatus of types 1 and 3.

Petitioners have admitted, in answering one of defend-

ants' interrogatories, that type 1 apparatus is not an infringement. (R. 18.) The issue narrows down, therefore, to types 2 and 3, *i. e.*, a trussed or stiffened chute supported by a cable from a tower, and the same chute supported in part by a boom.

Answering petitioners' brief in which it is stated this type 1 apparatus was not complained of because of the immobility of the apparatus and lack of any boom, we call attention to the fact that petitioners made no effort to disclaim such apparatus, publicly or otherwise, until after seeing defendants' affidavits filed in opposition to the preliminary injunction motion, showing this cable type of suspension as used in St. Joseph, Mo., in the summer of 1908, together with other defenses which plainly showed that it would be unwise for petitioners to contend for an interpretation of the Callahan claims sufficiently broad to include an inclined cable which could be swung from the tower at different angles, as the equivalent of a boom, although the decision of the Sixth Circuit Court of Appeals (262 Fed. 958) contained statements broad enough to justify the public in assuming that Callahan was a pioneer as to everything of this nature regardless of details.

History of Callahan Patent.

(A) Interferences in the Patent Office.

The Callahan patent, No. 948,719, issued February 8, 1910, on an application filed January 21, 1909. This application became involved in the Patent Office in two interferences; one a three-party interference, No. 30,533, involving Callahan, Emtman and Smith; the other a two-party interference, No. 30,618, involving Callahan and Emtman. (R. 641-644.)

The three-party interference involved very broad claims. Each party, in the summer of 1909, filed a preliminary statement, *i. e.*, a sworn statement, giving their dates of conception, disclosure, reduction to practice, etc., with respect to their inventions. This interference was won by Smith, through a concession of priority from Callahan and Emtman, after a conference between the three attorneys for the parties and with knowledge of the contents of the three sworn statements. (R. 371, Q. 15.)

The two-party interference involved what we maintain are subordinate claims, and was won by Callahan through a concession of priority from Emtman. These interferences are discussed more fully on another page of this brief. As a result of these two contests and settlements the patents dominate in the following order: Smith, Callahan, Emtman. See the record of the Cincinnati suit, "Joint Exhibit for Plaintiffs and Defendants," which contains these concessions.

All three patents were assigned to the Concrete Appliances Company of Missouri, and issued the same day, February 8, 1910, to said company. Concrete Appliances Company of Missouri assigned them to the Concrete Appliances Company of Los Angeles, California, November 12, 1910. An exclusive license was granted to William H. Insley, of Indianapolis, September 13, 1915, subject to the right of the F. O. Engstrom Company, of Los Angeles, California, to make and use the apparatus in its building operations. (Said Engstrom Company had owned the Emtman application from the out set through an assignment made February 6, 1909, before the application was filed in the Patent Office, and this company conducted the prosecution of the application.) An arrangement was made whereby William H. Insley has been permitted to license the Ransome Concrete Machinery Company and the Lakewood Engineering Company.

(B) Suits Elsewhere Based on This Patent.

The Callahan patent has been made the basis of the following suits in the U. S. Courts:

In St. Louis, Missouri, *Concrete Appliances Co.* v. *E. C. Gerhard Co. & Board of Education of the City of St. Louis* in March, 1910. This suit was dismissed for want of prosecution in September, 1911.

In Los Angeles, California, *Concrete Appliances Co.* v. *Insley Mfg. Co., Langford, Bacon & Meyers and Snare & Triest,* in the fall of 1913.

In the Western District of Pennsylvania against a party named Hogg.

In the Western District of Missouri against a party named Gray. (See Defendants' Record, p. 352 for this list.)

In Chicago, Illinois, in August, 1916, entitled *Concrete Appliances Co.* v. *Witherspoon-Englar Co. and Archer Iron Works,* dismissed for want of prosecution October, 1920.

In Cincinnati, Ohio, in August, 1916, entitled *Concrete Appliances Co. & William H. Insley* v. *Dietrich Meinken, Roy C. Owens and George B. Curd,* involving both the Callahan patent and the Smith patent 948,746, this case having been decided by the Court of Appeals in January, 1920 (262 F. R., 958), sustaining the Callahan patent and holding the Smith patent invalid.

There was also a suit in Canada (Vancouver, B. C.) on the corresponding Canadian Callahan patent, in 1913, entitled *Concrete Appliances Co.* v. *Rourke et al.,* No. 3287, in addition to the present suit. None of the suits filed in the United States went to a hearing on the merits except the one in the Sixth Circuit in which, as we shall show, there was a very meager defense. (See Defend-

ant's Exhibit 65 and statement of counsel at the bottom of page 345 of the Record.)

(C) The Present Suit in the Third Circuit.

The present suit was intended by defendants as a test case, so that this Callahan patent may be adjudicated fully and fairly after a thorough investigation and presentation of the history of the art and with respect to two types of apparatus, in order that the public generally, and more particularly contractors, engineers, and builders, may know what equipment they are free to use and what equipment they may not use.

Suit was brought July 22, 1920, and a hearing on a preliminary injunction motion was had, the court suggesting that defendants file a bond, plaintiffs acquiescing. Defendants accepted the suggestion and filed the bond, without presenting their case on the merits. (R. 658.)

Interrogatories were then filed by defendants, asking what claims of the patent in suit were relied on, and also asking plaintiffs to state the earliest date of invention which they would allege for the respective claims in suit. Plaintiffs answered the interrogatory regarding the claims, specifying claims 1, 2, 5 and 13 of the Callahan patent, but were not required by the court to disclose their earliest date of invention. They answered further interrogatories to the effect that defendants' type 1 apparatus was not an infringement.

Defenses—Claims in Suit Are Invalid (A) as Same Combination of Five Elements, or Their Equivalents, Was in Use Before the Date of Callahan's Alleged Invention for Distributing Not Only Concrete, But Grain, Coal and Other Materials.

For convenience, we shall divide these prior defenses into groups, discussing them as they developed in particular localities.

INGALLS BUILDING.

Built in Cincinnati 1902-3: This building is generally conceded to be a pioneer of its type, being the first tall, reinforced concrete building in the United States. Its construction was described and illustrated in considerable detail in the Engineering News of July 30, 1903 (see Exhibit 7). This building was built in the main with the standard apparatus available about that period and still in use. It consisted of a Ransome tower, which was built higher and higher by adding sections to it as the building progressed, a hoist within the tower for hoisting the concrete from the mixer, a wooden hopper supported on the tower and at its outer end by upright wooden planks on the floor. Hand carts received the concrete from the hopper, and were pushed about by the workmen and the concrete dumped into the forms.

When the second floor was reached a modification was made in this apparatus, proposed by R. P. Anderson, vice-president of the Ferro Concrete Construction Company. This change consisted in permitting the concrete to flow from the hopper through a series of metal chutes or troughs supported on braces or horses, and moved about by hand to distribute the concrete over the entire floor area of 50 x 100 feet. As many as ten sections of

chute were used as a maximum, with a minimum of one section—see Photograph Exhibits 5, 6 and 7, also Culp Exhibit 24. The use of this apparatus is clearly established by the photographs referred to, the stipulated testimony of the photographer, C. H. Longley (R. 273), the deposition of A. E. Culp, superintendent of the Ferro Concrete Construction Company (beginning with page 270), and the stipulated testimony of George Botsung (R. 281).

Culp testified that the floor area of this building was "very small" (Q. 72), and for this reason the use of chutes showed no economy over the wheelbarrow or cart method, and therefore the chutes were not used above the second floor, although the chuting apparatus was entirely successful (Q. 77). He also explained that the use of carts or chutes at the present time also depends upon the size of the building and the yardage of concrete; that putting in and taking out a chuting system is very costly; and that his company, the Ferro Concrete Construction Company, today in many cases, finds it more economical to wheel concrete than to chute it, even with the greatly improved modern apparatus (Qs. 68-70). Culp testified (Q. 79) that one or two of the original steel chute sections were still in existence at their warehouse, and plaintiffs' counsel was offered the privilege of inspecting them if he wished.

Mr. Culp also brought out the fact that at that time the concrete engineers in the United States were all in favor of a very dry mixture, whereas today the view is just the reverse, calling for a wet mixture (Q. 87).

The use of this apparatus on the Ingalls Building was also corroborated by a Chicago contracting engineer, L. J. Mensch, whose deposition begins on page 144. He testified that he was in Cincinnati at the time the Ingalls

Building was proposed, and that he suggested building it of reinforced concrete. He also testified to visiting the building and inspecting the operations on the second and third floors and seeing very wet concrete flowing from a single section of chute supported at its outer end by a rope, or two ropes, fastened on the top of the tower to the end of the chute; and that a man was moving the end of the chute back and forth a few feet while the concrete was running out of the end. In other words, the chute was being swung back and forth.

Among the other witnesses called by defendants a considerable number knew of the Ingalls Building as a pioneer structure of this type.

Answering plaintiffs' brief, which alleges that this apparatus was an abandoned experiment, we call attention to the fact that its publication, with photographs, in the summer of 1903 was a disclosure to the public which would enable any resourceful contractor to make use of chutes, whether supported by trestles or by any other conventional supporting means. It is hardly correct to call this an "abandoned experiment," since the temporary discontinuance of the apparatus was due to special local conditions, which apply as much today as they did at that time. Similar apparatus was used afterwards (R. 275, Qs. 77-79). This apparatus solved the real problem, which was that wet concrete could be made to flow through chutes inclined at a very flat angle, as shown in the publications referred to and in Exhibit 5 (R. 273, Q. 43).

The apparatus comprised a tower, hoist, hopper and chutes supported by horses as a substitute for a boom. No carts were used on the second floor, except possibly where the concrete was dumped into the column forms, the inspector demanding a drier mixture for the columns. In fact, similar apparatus is used in many cases today

for depositing concrete in column forms (R. 273, Qs. 45-49).

Plaintiffs are mistaken in alleging that the hopper was not supported by or vertically adjustable on the tower. It was supported partly by the tower, and was, in fact, moved from floor to floor as the work progressed (R. 274, Qs. 53-55).

Regarding Mensch's testimony, this witness does not approve of very wet concrete or chute distribution, except in a few special cases, and it is therefore incorrect to assume that he failed to see the possibilities in this Ingalls' building apparatus. As shown elsewhere in this record, government engineers did not approve of this method of construction for many years after the time in question.

Mensch explains very clearly why the expense of such apparatus on many types of work is prohibitive as compared with the wheelbarrow or cart method, which is still used. (See p. 150, Q. 30, and p. 157, Q. 77.)

Mensch's testimony brings out the fact that it was old to raise a boom on a tower during the erection of a building. This was done on his Masonic Temple work in 1903-04. Another instance is the McGraw Building, built in New York in 1906-07, and described at least as early as November, 1907, in a publication quoted from on page 147 of the Record. Each boom was 75 feet long, commanded a large area, and was raised from floor to floor on the tower in building this eleven-story concrete building, and was used to pick up and deposit buckets of concrete.

LYNNHAVEN HOTEL,

built in Norfolk, Virginia, in 1906, to receive visitors to the Jamestown Exposition in the spring of 1907.

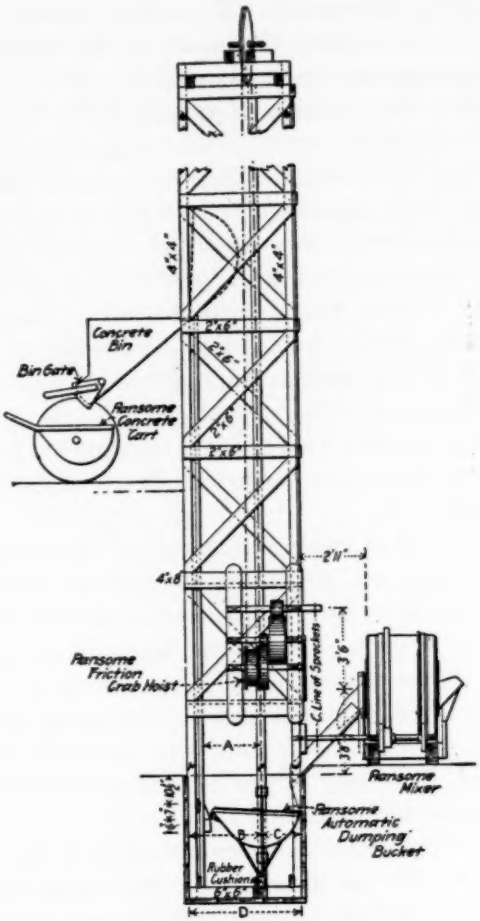
The concrete work was supervised by Arthur L. Smith and was carried on during the late summer and entire fall of 1906.

This was the same Smith whose patent, 948,746, issued the same day as the Callahan patent in suit, and to whom Callahan conceded priority as to certain broad claims, recently held invalid by the U. S. Circuit Court of Appeals for the Sixth Circuit.

The hotel had an eight-story reinforced concrete frame and was the first tall building of this type to be erected in Norfolk. A photograph of the concrete frame is in evidence as Exhibit 19[1]. This photograph was produced by Smith, who had had it in his possession since it was taken by the photographer under his direction in the fall of 1906 (R. 217, Qs. 6-8). In the photograph there is a sign on the building reading:

> "The Lynnhaven modern fire-proof hotel, 200 rooms, 75 private baths, opens April 1, 1907."

The concrete for the first three floors was distributed in the usual manner, that is, by means of a tower, hoist, hopper and wheelbarrows. Such apparatus was commonly used at that time, Smith testified in answer to Q. 35, p. 219, and stated on being shown Deefndants' Exhibit No. 21, illustrated in the accompanying cut, that "this tower was used to quite an extent throughout the country at the time I conceived the idea of spouting" (Q. 36), and that (Q. 37, p. 220) "the hopper was generally lifted from one story to another as the work progressed." When the fourth floor was reached Smith tried out a modification of the apparatus, which he tes-



A PLANT FOR MIXING AND HOISTING CONCRETE

Defendants' Exhibit 21
Ransome Concrete Machinery Co.,1906 Catalog. Page 42.

tified he had in mind for some time, in order to permit the spouting of concrete. He made a chute, supported the upper end beneath the mouth of the hopper with a swivel arrangement and supported the outer or lower end of the chute by a cable or block and tackle from a point near the top of the tower. This enabled the chute to be swung from side to side. When the concrete was flowing down the chute, the lower end of it rested on a second inclined chute, which was supported on horses or movable frames. Part of the time a third section or chute was employed. These chutes could be moved about by the workmen to change the point of distribution of the concrete and in this manner any part of an area could be reached having a radius of 30 to 40 feet from the tower. Wheelbarrows were used to carry the concrete to the portions of the floor area beyond the reach of these two or three chutes.

This apparatus was used from about the fourth to the seventh floors and proved to be entirely satisfactory. The main point to be demonstrated, apparently, was that concrete of a proper consistency could be made to flow through chutes without causing separation of the sand and cement from gravel or stone. This matter Smith had discussed on several occasions with architects and engineers, and, like many others at that early period, they were opposed to the method (Q. 5).

It will be noted that this demonstration in the summer and fall of 1906 was more than a year earlier than any date claimed for Callahan in his alleged experiments with the flow of concrete through pipes on the Majestic Theater Building in Los Angeles.

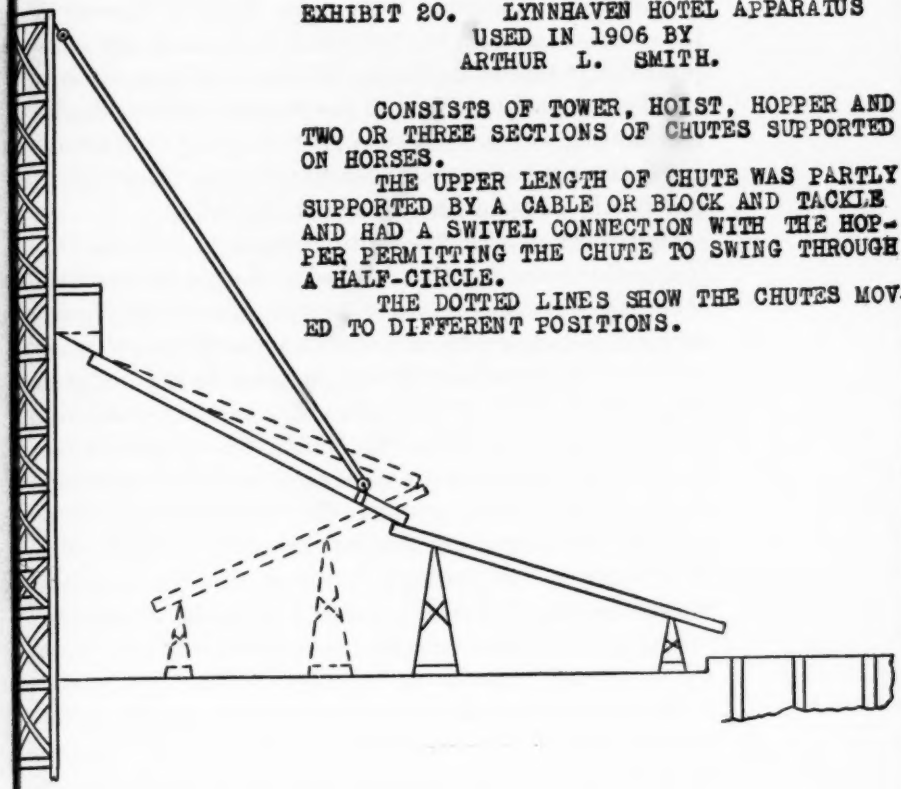
Smith made a sketch of this apparatus, which is in evidence as Exhibit 20. Part of it is reproduced in the accompanying cut. It consisted of a tower, hopper, hoist, chute and a cable for supporting the chute during the

EXHIBIT 20. LYNNHAVEN HOTEL APPARATUS USED IN 1906 BY ARTHUR L. SMITH.

CONSISTS OF TOWER, HOIST, HOPPER AND TWO OR THREE SECTIONS OF CHUTES SUPPORTED ON HORSES.

THE UPPER LENGTH OF CHUTE WAS PARTLY SUPPORTED BY A CABLE OR BLOCK AND TACKLE AND HAD A SWIVEL CONNECTION WITH THE HOPPER PERMITTING THE CHUTE TO SWING THROUGH A HALF-CIRCLE.

THE DOTTED LINES SHOW THE CHUTES MOVED TO DIFFERENT POSITIONS.



time that it was swung to one side to change the angle of distribution.

As we shall show later, this was the precise apparatus claimed to have been used by Callahan, or, as we contend, by Emtman, in January, 1908, on the Majestic Theater in Los Angeles, except that the Smith apparatus was more practical, in that he used open troughs or chutes, whereas small pipes were used first on the Majestic Theater Building, causing so much difficulty with clogging that successively larger sizes were experimented with. The modern practice is to use chutes almost exclusively.

In connection with this Smith drawing, we contend that if the claims are construed broadly enough to constitute the inclined supporting cable or rope, a boom, this Lynnhaven Hotel apparatus constitutes a use of the invention considerably more than two years prior to the Callahan filing date in 1909. If the claims are narrowly construed, as we contend they should be, neither this apparatus nor the later Majestic Theater apparatus, on which plaintiffs rely, will support the counts. However, the supporting rope or cable used by Smith is the mechanical equivalent of a boom, and we contend, therefore, that the Callahan claims are unpatentable over the prior Smith apparatus.

The record shows that the tower and the hopper were raised several times as the Lynnhaven Hotel progressed from about the fourth to the seventh story, providing the *vertical adjustment* of the cable (boom) and the hopper, which comprise the additional limitations of claim 5 in suit.

Smith's testimony was corroborated in its essential particulars by R. B. Preston and T. A. Tatterson. Preston was inspector for the architects on the Lynnhaven Hotel during the last half of 1906. Tatterson is the son of E. Tatterson, deceased, the latter having been the contractor for this hotel.

Preston testified (R. 238) regarding the use of one or possibly two chutes supported on saw horses in conjunction with a tower, hoist and hopper, the hopper being elevated during the progress of the work. His recollection of the second chute was rather doubtful, and he did not recall the third chute. However, the claims in suit do not call for a second chute or conduit. Neither did he recall the cable from the lower end of the first chute to the tower.

By way of explanation of Preston's indistinct recollection of some of these details recalled more vividly by Smith and Tatterson, his testimony shows that Preston was not particularly interested in the means of conveying the concrete to the point of deposit, being more interested in the consistency of the concrete and the ultimate strength of the structure (R. 246, X-Qs. 81-82).

Tatterson testified (R. 249) that he worked on this building with his father during his summer vacation of 1906, returning to Washington and Lee University the latter part of September, where he had been studying engineering for two or three years. Before returning to college he saw the Smith apparatus in use, consisting of a tower, hoist, hopper and first section of trough supported by a cable or rope, with one or possibly two additional lengths of trough supported on horses.

There is some inconsistency regarding the time in 1906 when the work was begun, as brought out by Preston and Tatterson, Preston stating that he went to work in the early part of September, 1906, at which time the excavations had been made and the piling driven, whereas Tatterson returned to college the latter part of September, at which time the concrete structure had at least reached the fourth floor. Preston gives no incident by which to fix the early September date, however, and if he was as-

time that it was swung to one side to change the angle of distribution.

As we shall show later, this was the precise apparatus claimed to have been used by Callahan, or, as we contend, by Emtman, in January, 1908, on the Majestic Theater in Los Angeles, except that the Smith apparatus was more practical, in that he used open troughs or chutes, whereas small pipes were used first on the Majestic Theater Building, causing so much difficulty with clogging that successively larger sizes were experimented with. The modern practice is to use chutes almost exclusively.

In connection with this Smith drawing, we contend that if the claims are construed broadly enough to constitute the inclined supporting cable or rope, a boom, this Lynnhaven Hotel apparatus constitutes a use of the invention considerably more than two years prior to the Callahan filing date in 1909. If the claims are narrowly construed, as we contend they should be, neither this apparatus nor the later Majestic Theater apparatus, on which plaintiffs rely, will support the counts. However, the supporting rope or cable used by Smith is the mechanical equivalent of a boom, and we contend, therefore, that the Callahan claims are unpatentable over the prior Smith apparatus.

The record shows that the tower and the hopper were raised several times as the Lynnhaven Hotel progressed from about the fourth to the seventh story, providing the *vertical adjustment* of the cable (boom) and the hopper, which comprise the additional limitations of claim 5 in suit.

Smith's testimony was corroborated in its essential particulars by R. B. Preston and T. A. Tatterson. Preston was inspector for the architects on the Lynnhaven Hotel during the last half of 1906. Tatterson is the son of E. Tatterson, deceased, the latter having been the contractor for this hotel.

Preston testified (R. 238) regarding the use of one or possibly two chutes supported on saw horses in conjunction with a tower, hoist and hopper, the hopper being elevated during the progress of the work. His recollection of the second chute was rather doubtful, and he did not recall the third chute. However, the claims in suit do not call for a second chute or conduit. Neither did he recall the cable from the lower end of the first chute to the tower.

By way of explanation of Preston's indistinct recollection of some of these details recalled more vividly by Smith and Tatterson, his testimony shows that Preston was not particularly interested in the means of conveying the concrete to the point of deposit, being more interested in the consistency of the concrete and the ultimate strength of the structure (R. 246, X-Qs. 81-82).

Tatterson testified (R. 249) that he worked on this building with his father during his summer vacation of 1906, returning to Washington and Lee University the latter part of September, where he had been studying engineering for two or three years. Before returning to college he saw the Smith apparatus in use, consisting of a tower, hoist, hopper and first section of trough supported by a cable or rope, with one or possibly two additional lengths of trough supported on horses.

There is some inconsistency regarding the time in 1906 when the work was begun, as brought out by Preston and Tatterson, Preston stating that he went to work in the early part of September, 1906, at which time the excavations had been made and the piling driven, whereas Tatterson returned to college the latter part of September, at which time the concrete structure had at least reached the fourth floor. Preston gives no incident by which to fix the early September date, however, and if he was as-

used for distributing concrete. Two of them were colored laborers. It will also be borne in mind that Smith does not claim to have used this apparatus on each floor of the building, but only from about the fourth to the seventh floors, so that a thorough familiarity with the apparatus used on the other floors would not have resulted in a knowledge of the Smith apparatus.

We contend that the testimony of *one* opposing witness as to the existence of a trough is more persuasive than the negative testimony of a considerable number of others.

The testimony of defendants' witnesses, Preston and Tatterson, shows that plaintiffs' attorney conferred with both of them at the time he visited Norfolk in the summer or fall of 1920, presumably for the purpose of preparing the affidavits used in rebuttal in connection with the preliminary injunction motion (R. 241, Qs. 26-31, and R. 254, Qs. 64-71). Preston and Tatterson said that they told plaintiffs' attorney what they knew, but that they were not asked to sign an affidavit. This investigation by plaintiffs' attorney shows that it was as easy to find witnesses who *did* remember Smith's apparatus as it was to find those who did not remember it, and the fact that these other witnesses were passed by is significant.

Plaintiffs are indeed in an embarrassing situation with reference to this early use, as they have owned the Smith patent ever since it issued, containing broad claims, shown from the record at the time to have been based by the inventor on this Lynnhaven use, and which claims plaintiffs have accepted on the assumption that such use was true, and, after their attorney had had ample notice of the specific 1906 building in Smith's preliminary statement and had had an opportunity to visit Norfolk, had he wished to do so. Instead, plaintiffs' attorney (also Emtman's attorney) accepted a favorable report of

the investigation made by Smith's attorney, James Love Hopkins, of St. Louis (R. 371, Qs. 12-18), whose testimony is not even mentioned by plaintiffs in their discussion of this prior use. Furthermore, in the Cincinnati suit, based on the Smith and Callahan patents, plaintiffs no doubt would have carried the date of Smith's invention back to this Lynnhaven job in 1906 had the defendants made it necessary for them to do so.

The portions of the testimony quoted by plaintiffs are somewhat misleading, but the apparent inconsistencies are explained in many cases by reading either the entire answers or those immediately following: For example, Preston did not testify that the "general features" of the Lynnhaven apparatus were shown both in Smith Exhibit 20 and Kern Exhibit E, but limited his answer strictly to the "hopper arrangement" in discussing the Kern sketch in his answer to Q. 39 (not Q. 30 as stated in plaintiffs' brief).

Smith's formal affidavit accompanying his application stating that he did not believe his invention had been in "public use" for more than two years is readily explained by the fact that he may not have understood it fully or he may have considered this 1906 apparatus to have been an *experimental* use of his invention, followed by further use on the Vinery Building and the St. Louis Coliseum. Doubtless plaintiffs will agree that this was an experimental use in 1906, as they would hardly wish to have it charged that they brought suit in the Cincinnati court on a patent to Smith which, to their knowledge, had been in public use for more than two years before the application was filed; in other words, on an invalid patent. Whether a public use or an experimental use, it is a prior invention, and was undoubtedly successful.

Tatterson would unquestionably remember this apparatus very distinctly, for the reason that he was studying

engineering at college and was doing this work during his summer vacation to gain experience. His memory, therefore, is certainly more dependable than that of a few laborers who had no particular interest in their work or the work of others about them. The fact that Tatterson's father, who was one of the big stockholders in the building (R. 253, Qs. 49-51), failed early in 1907, and that Tatterson was compelled to leave college, come home, and go to work, would certainly make the developments of this period fix themselves forever in his mind.

In view of all the circumstances of the case, including the ownership of the Smith patent by the plaintiff company, the suit on it in Cincinnati (in which it was doubtless hoped it would be sustained as a pioneer patent) and in view of the further fact that *plaintiffs'* attorney, eleven years after this Lynnhaven job, was able to find two witnesses, Tatterson and Preston, who *did recall* this 1906 apparatus, but those affidavits were not wanted at the time, we submit that plaintiffs, in a court of equity, are hardly in position to deny this use.

ST. LOUIS COLISEUM BUILDING, JULY-OCTOBER, 1908.

The concrete distributing apparatus used on this building was also devised by Arthur L. Smith as a further elaboration of his Norfolk apparatus used in 1906-1907. After his work on the Vinery Building in 1907, Smith went to New York with the Fuller Company for a short time and from there to St. Louis, on a vacation trip. While there he saw an opportunity to further develop his concrete distributing apparatus in connection with the proposed St. Louis Coliseum and he accepted employment with a contractor named Gray. The proposed apparatus was explained to Gray and permission given to construct it. It proved to be a complete success. (R. 223, Q. 75.)

The Coliseum was a peculiar structure having an oval shaped concrete and steel balcony running completely around it and constructed as a series of steps or tiers. These steps on a steep slope would have made it very difficult to have used the ordinary wheelbarrow method of distribution.

The apparatus designed and built by Smith is illustrated in the accompanying halftone reproduction of the original photograph, Exhibit 22, taken by Eugene Taylor, August 27, 1908. Other photographs showing the progress of the work constitute Exhibit 3, four pages of halftone cuts taken from a catalogue of the Gray Construction Company, St. Louis, entitled "Buildings of Character."

This Coliseum apparatus comprised the complete combination of the claims in suit, i. e.: (1) a tower, (2) a hoist, or automatic dumping bucket, (3) a hopper, (4) a chute, (5) a horizontally movable boom for the chute. The horizontal boom was pivoted at the top of the tower and therefore did not have to be raised as it was located initially at its maximum height. The hopper was raised during the progress of the work as will be seen from the progress photographs.

Smith describes the operation of the boom as follows (R. 223, Q. 77):

> "It was operated on what you might term a turn table as I found it more applicable for this class of work. The boom was so arranged and attached to the spouts that you could lift them at any angle and swing them around at any angle by means of a block and fall."

This apparatus, as stated before, was constructed in July, 1908, and used in August, 1908, more than five months prior to the filing date of the Callahan patent, January 21, 1909. It embodied all five elements of the counts in suit and in addition, the hopper was vertically

adjustable, a limitation found in claim 5 only. The other adjustment in this claim, *i. e.*, the vertical adjustment of the boom was not practiced in this apparatus because it was not required. Smith testified, however, that the vertical adjustment was part of his original conception (R. 226, Qs. 98-103), and, of course, this detail was old at that time.

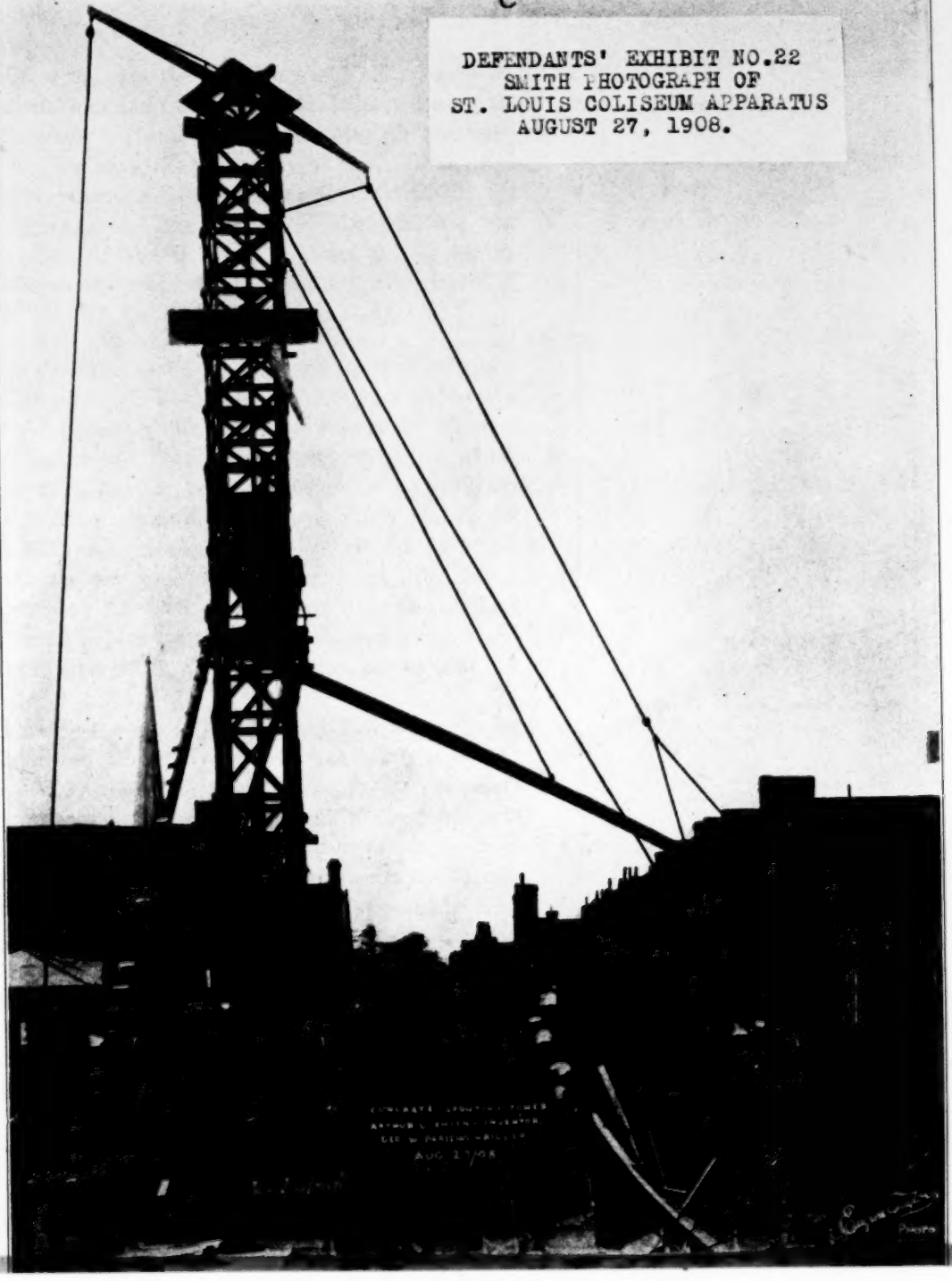
As a single specific example, we refer to the McGraw Building, New York, an eleven story structure built in 1906 and 1907 (R. 147, Q. 18). Four booms, each 75 feet long, were mounted on the four corners of the temporary construction tower, these booms being raised from time to time as the building progressed. The booms were used to raise and swing buckets of concrete in addition to picking up other material. The apparatus is described in the Transactions of the American Society of Civil Engineers, June, 1908, and published earlier. Other typical examples are referred to throughout this brief.

The photographs, Exhibits 3 and 22, were produced from *two sources*, St. Louis and Washington, and were all fully identified by Eugene Taylor, the photographer whose stipulated testimony is found on page 385 of defendants' record.

His testimony is that the Coliseum, to his knowledge, was erected during July, August, September and October, 1908; that he took the photographs, Exhibit 3, pursuant to a contract with the Gray Construction Company to take a picture each week and that he took the picture, Exhibit 22, at the request of Arthur L. Smith and put on the negative shortly after it was developed, the wording and date appearing thereon.

C

DEFENDANTS' EXHIBIT NO.22
SMITH PHOTOGRAPH OF
ST. LOUIS COLISEUM APPARATUS
AUGUST 27, 1908.



In addition we have the testimony of F. M. Woodward (R. 136), who saw the Coliseum several times during the course of its erection and who identified the photographs, Exhibit 3. We have the testimony of S. C. Black, who also saw this concrete distributing apparatus (R. 352, Qs. 46-48). Herman A. Banks testified the building was built in 1908 (R. 362, Q. xxxiv). John W. Goebel inspected the concrete apparatus casually as he passed in the street (R. 381, Qs. 93-95; R. 384, R-D. Q. 122).

We also have the testimony of Smith's patent attorney, James L. Hopkins (R. 369), who understood when he prepared the application that the apparatus had been used at the Coliseum and that it had been dismantled at the time, the work having been finished. In addition we have the Smith preliminary statement executed July 28, 1909 (R. 637), specifically mentioning the Coliseum together with the Smith patent drawing, filed in the Patent Office, February 23, 1909 (R. opposite page 644), which was obviously copied by the draftsman from the Smith photograph, Exhibit 22, as to the main structural features.

Plaintiffs, in their brief, touch very lightly on the St. Louis Coliseum. Obviously, there is very little that they can say. They relied on this defense in the Canadian suit, the invention was owned by them, the apparatus in its essentials is disclosed in the Smith patent, is illustrated fully in the five photographs offered by defendants, and is proved beyond a reasonable doubt to have been used in August, 1908. In fact, it is not disputed.

This defense, therefore, shifts the burden of proof to the plaintiffs. It is incumbent on the plaintiffs to prove an earlier date of invention by the *same weight* of evidence as was required of defendants in proving this Coliseum use. We call attention to the following decisions:

Smith and Griggs Manufacturing Company v. *Delia Sprague, Admrx. of Leonard A. Sprague, deceased,* 123 U. S. 249, Nov. 14, 1887, where the court says:

> "In considering the evidence as to the alleged prior use for more than two years of an invention, which, if established, will have the effect of invalidating the patent, and where the defense is met only by the allegation that the use was not a public use in the sense of the statute, because it was for the purpose of perfecting an incomplete invention by tests and experiments, the proof on the part of the patentee, the period covered by the use having been clearly established, should be full, unequivocal, and convincing."

In *Webster Loom Co.* v. *Higgins,* 4 Ban. & A. 88, the court (at page 98) says:

> "The burden of proof rests upon the defendants, to show, beyond a fair doubt, the prior knowledge and use set up; but, where they have sustained that burden by showing such knowledge and use prior to the patent, the burden of showing the still prior invention claimed, by at least a fair balance of proof, must rest upon the plaintiff."

In *Westinghouse Electric & Mfg. Co.* v. *Catskill Illuminating & Power Co.,* 121 Fed. 831 (C. C. A., Second Circuit, February 25, 1903), the court says:

> "This printed publication is such a disclosure of the subject-matter of the patents in suit that, if prior thereto, it would constitute an anticipation."
>
> "To support the burden thus cast upon it of proving to the satisfaction of the court that the supposed inventions in suit were made prior to April 22, 1888, complainant has introduced a photograph and the evidence of two witnesses, Messrs. Brown and Page. One of said witnesses has testified that said photograph represented a motor which was in Tesla's shop in the fall of 1887, and in which the difference in phase was secured by the introduction in one of the circuits of a coil having self-induction. There

is nothing in the photograph, however, to indicate the means by which said motor was operated, nor whether it was adapted to receive a single or double current from the generator. Its construction is at least as suggestive of use in connection with the earlier polyphase as with the later split phase patents. We are therefore confined to a consideration of the testimony of said two witnesses."

After considering the testimony the court stated as follows:

"This evidence is clear, direct and persuasive as to a disclosure by Tesla of various schemes for operating motors on the split phase principle. But it falls far short of the requirement in such a case.

"The burden which rested upon the defendant in the first instance has been transferred to the complainant, and it must furnish the court with convincig proof that the anticipation has been anticipated. *Westinghouse Electric & Manufacturing Company* v. *Saranac Lake Electric Light Company* (C. C.), 108 Fed. 221 222. *Clark Thread Company* v. *Willimantic Linen Company,* 140 U. S. 481, 11 Sup. Ct. 846, 35 L. Ed. 521. It is to be noted that this testimony relates to events which occurred 12 years before."

To the same effect are the following cases:

St. Paul Plow Works v. *William Starling,* 140 U. S. 404.

Brooks et al. v. *Sacks,* 81 Fed. 403.

Westinghouse Electric & Mfg. Co. v. *Saranac Lake Electric Light Co.,* 108 Fed. 221.

Torrey et al. v. *Hancock,* 184 Fed. 61.

Crone v. *John J. Gibson Co.,* 237 Fed. 637.

Clark Thread Co. v. *Willimantic Linen Co. et al.,* 140 U. S. 481.

Rogers v. *Fitch,* 81 Fed. 959.

New England Motor Co. v. *B. F. Sturtevant Co.,* 150 Fed. 131.

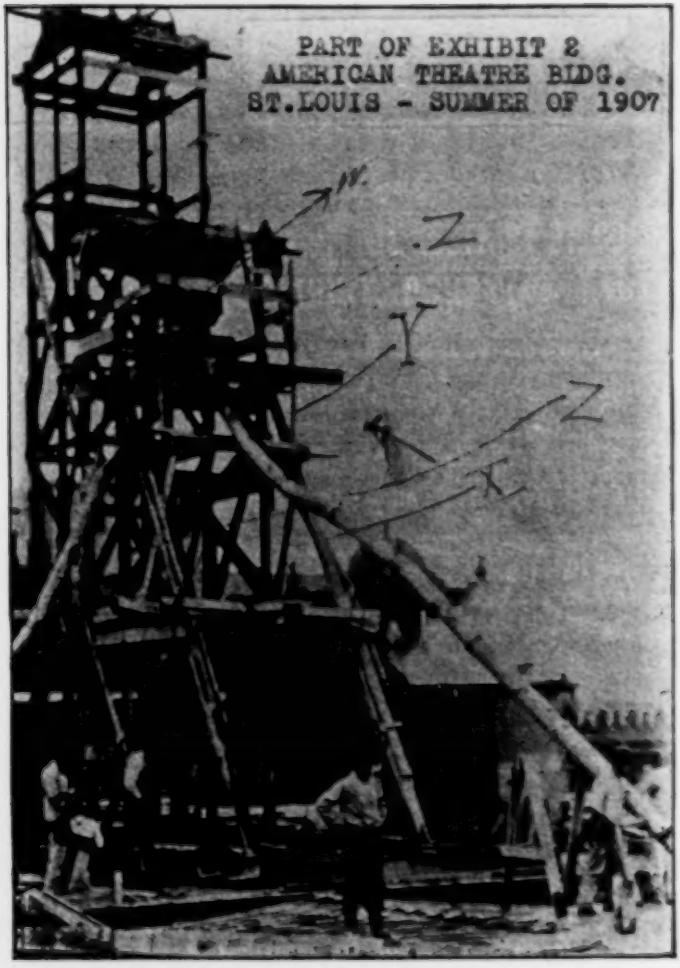
American Theater Building, St. Louis, Missouri.

This building was a twelve story steel frame structure encased in concrete. The building was begun in the early summer of 1907.

Throughout practically the entire work of construction, the concrete was distributed through a line of jointed pipes after being hoisted by a hoisting bucket and discharged through a hopper communicating with the upper end of the pipe line. The pipe sections were suspended from the steel framework of the building and moved about to enable the workmen to discharge concrete over the entire floor area the lower section of the pipe being swivelled to permit it to swing around to facilitate this distribution. The hopper was raised from time to time.

The apparatus, on the top floor, is shown in Photographs Exhibit 2, and by a memory sketch of Woodman, Exhibit 4. The time of the erection of this building is established by Exhibit 33, the blue-print from the architect's office bearing date of June 8, 1907, written on the tracing by witness S. C. Black at the time, and by Exhibit 1, a reproduction of a page of the St. Louis Republic of February 16, 1908, announcing the completion of the building and describing the construction work, including the use of chutes for the concrete. Other exhibits, later referred to, also establish the date in addition to the testimony of half a dozen witnesses.

The concrete distributing apparatus was devised by Herman A. Bankes, who was employed by the Gilsonite Construction Company from 1897 to 1908—see deposition, beginning page 359, including the witness' deposition in the Canadian suit, copied into this record (pp. 360-362). This witness was a witness for Insley about


PART OF EXHIBIT 2
AMERICAN THEATRE BLDG.
ST.LOUIS - SUMMER OF 1907
W.
Z
Y
Z
X

the winter of 1914-15 in said Canadian suit, and testified regarding this American Theater Building defense on behalf of the said Insley, one of the plaintiffs herein.

Bankes' testimony, briefly, is to the effect that he conceived the scheme of using a tower, hoist, hopper and chutes supported from a swinging boom, in the spring of 1907, while he was employed in the erection of the Ely-Walker Building, St. Louis, superintending the concrete work, and that he proposed that this apparatus be used on said building, but was not allowed to try it, as the building, which was of reinforced concrete construction, was too far advanced. He made a sketch of this proposed apparatus at the time, and submitted it to those in charge of the work. The sketch was not preserved, but was clearly recalled by the witness John W. Goebel, who reproduced its essential features from memory as Exhibit 37.

An examination of the sketch and of the testimony shows that the improvement consisted merely in adding a boom and a chute to the existing apparatus. On page 360, Qs. XI-XIX, the witness explained that the concrete distributing apparatus used on the Ely-Walker Building comprised a hoist, bucket or skip which was hoisted in the tower and dumped into a receiving hopper, which delivered it into the wheelbarrows. This, it will be noted, was in accordance with the prevailing practice at the time. Bankes explained that it took twenty-five men to take the material (concrete) away as fast as it could be mixed and that they had only six men below putting it into the mixer, "and we thought the chutes would do away with a lot of labor and cut down expenses. I drew up a plan to hang a boom and chutes from the tower, submitted to the company, and they didn't want to spend the money on that job, as it was over half done."

When Bankes was transferred to the American Theater Building by his employers, he adapted his proposed apparatus to the conditions there at hand, and as it proved entirely successful it was used throughout the erection of the building. The American Theater Building, however, having a *steel frame,* to be *encased* in the concrete, instead of being *reinforced* concrete construction, the erection of the steel frame was necessarily considerably in advance of the placing of the concrete which was to encase the steel members, and it was therefore neither practical nor necessary to use a boom for supporting the pipes to swing them around. The steel skeleton afforded a ready means for supporting the pipes by merely fastening them temporarily by wires or ropes to the nearest overhead beam, whereby the pipe line could be extended in almost any direction and could be moved sufficiently for the swiveled end to reach any part of the floor area.

This concrete distributing apparatus occasioned considerable interest in St. Louis and was observed by a number of outside parties, among them Andrew W. Woodman, of Chicago, who testified regarding his recollection of the apparatus. It was also commented on in the St. Louis Republic, Exhibit 1, as "A Novel Feature," a paragraph of the full page article being devoted to the novel and quick manner in which the concrete was hoisted and distributed "by means of chutes."

This publication appeared more than a year earlier than Callahan's filing date and the apparatus itself was used for a year and a half prior to said filing date and a half a year ahead of the earliest date of invention claimed by Callahan or on his behalf.

Bankes also testified that he superintended the construction of the Baden reservoir in St. Louis, which he thought was built in 1905-6, although another witness,

Goebel, whose memory seemed to be quite accurate throughout his testimony, stated it was built in 1903, the year prior to the St. Louis World's Fair in 1904. During part of this work the concrete was distributed through chutes, that is, wooden troughs resting on horses, forming a line having a maximum length of 240 feet, according to the testimony this witness gave on behalf of Insley in 1914 (R. 360). The chutes were moved to vary the point of delivery, particularly the last 16 foot section, which could be swung around (R. 365, Q. 49). In this respect the method was obviously similar to what had been used on the Ingalls Building in Cincinnati in 1902, except that the concrete mixer rested on the bank above the reservoir instead of being erected at the foot of a tower with a hoist in it.

Bankes produced the photographs A and B comprising Defendants' Exhibit 2, and testified that these were the identical two photographs produced during the Canadian deposition about six years earlier, reproductions of which were offered in evidence in that suit. The original photographs had been in his possession ever since (R. 363, Qs. 10-16).

This exhibit also includes a photograph of the Tootle-Campbell Building, St. Joseph, Missouri, produced by Bankes with the explanation that it was sent to him in 1908 by a man in St. Joseph and that he had had it ever since (R.363, Qs. 19-25). These four photographs were produced in the summer of 1920 by the witness when interviewed, and were reproduced and filed in opposition to the preliminary injunction motion. The witness, however, refused at the time to sign the affidavit in explanation of said photographs.

Bankes was asked why he did not apply for a patent on his American Theater apparatus and replied, "At the time I didn't think it could be patented." He also

stated that he did not have the money to start with (R. 367, Q. 77).

Bankes, as a former witness for the plaintiffs, was a hostile witness for defendants, which is evidenced by the fact that he refused to sign an affidavit in the summer of 1920 confirming his early testimony on behalf of plaintiffs, which affidavit was to have been filed in court and was, in fact, filed unsigned with an explanatory affidavit of counsel. The witness also refused to appear, in 1921, when first subpoenaed by a notary public and had to be subpoenaed a second time, several days later, by a U. S. Marshal (R. 359, Qs. 2-4). His animosity was further evidenced by the volunteered statement at the close of his testimony on page 368.

J. W. Goebel, another witness, called by defendants (R. 372), previously testified on behalf of the defendants in the Canadian suit, *Concrete Appliances Company* v. *Rourke et al.*, 3287, 1913. Mr. Goebel testified that he was president of the J. W. Goebel Contracting Company, St. Louis, and had been assistant manager of the Gilsonite Construction Company during the building of the Ely-Walker Company Building at 17th and Locust Streets, St. Louis. He had been acquainted with Herman A. Bankes and he described the apparatus used for elevating the concrete on the American Theater Building in 1907. He credited Bankes with this apparatus (R. 373, Q. 12). He was also familiar with the chutes used at the Baden reservoir in 1903, which was built by the Gilsonite Construction Company. He described the concrete distributing apparatus used in erecting the Ely-Walker Building, as the usual apparatus with a hopper which was raised from floor to floor on the tower to a maximum height above the top or eighth floor

(R. 375, Qs. 30-32, p. 378, Qs. 56-61), but testified that (Q. 35):

> "During the construction of the Ely-Walker Building, Bankes came into the office one day with a sketch showing a method by which he proposed to spout or chute the concrete into position instead of wheeling it. He proposed to do this by means of chutes suspended from a derrick which could be swung from side to side and raised or lowered as may be required.
>
> "(Objection omitted.)
>
> "Mr. Jones: Q. 36. Did you see the sketch?
>
> "A. Yes, Bankes showed it to me. It was made on a piece of yellow sketching paper."

He stated on cross-examination that he saw the sketch when Bankes brought it in and that it lay on his desk for quite a long time, also that he remembered "very distinctly he (Bankes) came in one day and asked for it" (X-Q. 96). The witness made a sketch (Exhibit 35) reproducing the Bankes sketch, as well as he could recall it. He recalled the general features, but, of course, not the details (R. 376, Qs. 41, 42). He referred to the proposed apparatus as a derrick consisting of a mast and a boom, the mast in this case being the tower. He also confirmed Bankes to the effect that the building was so far along it was decided not to use the new apparatus.

The concrete work on this Ely-Walker Building was done in the spring of 1907 and finished about July, which was not only the recollection of the witness, but the dates were established by progress photographs in a book of James Stewart & Company, the dates showing in said book being stipulated in the record (p. 385). The witness testified that the concrete work on the American Theater Building was begun about July, 1907, the foundation having been put in prior to that time and probably prior to May 10, 1907, the date on Blue-Print Exhibit 33, which showed a plan of the building (see R. 377).

The hopper on the tower was generally two, three or four floors above the floor where the concrete was being deposited (R. 378, Q. 62) and the witness testified that in *every* case where a hopper was used, there was always a man to open and close the gate at its lower end to regulate the flow of concrete (R. 380, Q. 85). The witness was quite familiar with the apparatus, as he visited the building about once a day (Q. 70). He explained that Bankes did not use the boom shown in the earlier sketch, as it was not necessary, "Because we had the steel beams to support these chutes with." The witness also testified that "Quite a number of people visited the building, while we were using these spouts for concrete, the builders, architects, material men and others interested in building industries" (R. 379, Q. 71). He recalled one particular discussion "About it being an economical method of placing concrete, something that we thought was brand new that had never been used before" (R. 379, Q. 73).

The witness testified that, since that time in 1907, he had used apparatus of this general character beginning immediately, that is, the following year, 1908, on the Tootle-Campbell Building, St. Joseph, Missouri. He stated that in this period from 1907 to the present day, his company had used chutes supported in various ways, principally by cables fastened to the top of a tower and reaching the floor, the chutes being suspended from the cable by block and tackle. The witness personally has also used chutes supported on trestles, but has never had occasion to use a boom, stating that a boom was used "In a place where you couldn't very well anchor your cable to support the chutes" (R. 380).

The Tootle-Campbell Building was built in the summer of 1908 at St. Joseph, Missouri, by the apparatus

just described, that is, a tower, hoist, hopper and chutes supported from cables. The witness personally visited the building about once a month. Dated photographs of the apparatus are in evidence as Defendants' Exhibit 14.

The witness also passed by the St. Louis Coliseum several times during its erection and testified that "They had a tower and a mixing machine and spouting" (R. 381, Q. 94).

The witness was asked on cross-examination if, in making his sketch reproducing the Bankes sketch, his recollection may not have been modified by structures which he had seen in recent times, to which he answered (combining answer X-Q. 113 and R-D. Q. 124):

> "There is a possibility of that, but every time that I saw the evolution of the system of handling concrete in structural reinforced buildings as we used it in the beginning and today, I always thought of the scheme that Bankes proposed, in that it seemed to bear out his idea."

Samuel C. Black, another witness familiar with the erection of the American Theater and Hotel Building, testified, beginning page 348, that he was with the Board of Education of the City of St. Louis in the building department, and that in 1907 he had been employed by F. C. Bonsack, the architect of said American Theater Building. He described the apparatus, including the hoist, hopper and pipes (R. 348). He also made a sketch, Exhibit 32, to illustrate his recollection of the apparatus. He was quite sure that the concreting was begun within a few days after June 8, 1907. He testified that they were trying to expedite matters as much as possible and the minute the contract was signed they were requested to get to work at once, which they did (R. 354, X-Qs. 66-70). The witness testified that the concrete distributing appa-

ratus was the invention of Herman A. Bankes, who by other equipment he had devised, especially in the control of cars used to carry the material to the mixer, "showed himself to be a very ingenious man." (R. 349, Qs. 11-19.)

The witness stated that he was greatly interested in this apparatus on account of its ingenuity and efficiency and that there was quite a bit of favorable discussion about it (R. 351, Qs. 35-37). He also stated that apparatus similar to it had been used almost continuously from that time to this with various changes, also that there were no special restrictions with reference to excluding the people from the work other than was usual on such buildings. The inference is that anyone could see the apparatus who wished to, particularly as it was readily visible through the open framework before the latter was enclosed within its walls and there was nothing to prevent knowledge of it being spread broadcast (R. 351, Qs. 38-41).

The witness also testified that the hopper was attached to the tower and was moved from time to time, that is, moved about every three floors (R. 350, Qs. 24, 25; p. 353, X-Qs. 62, 63), and that sufficient water was used in the concrete "to make it flow freely in the spouting" (R. 352, Q. 45). The photographs in Exhibit 2 show the hopper supported only in part on the tower and partly on the roof, but this is an immaterial detail, as the claims in suit do not state how the hopper shall be supported, and furthermore the standard practice at that date (1907) was to bolt the frame of the hopper to the tower and then raise it from time to time with a block and tackle, after unbolting it, permitting it to be bolted in some higher position.

The witness produced a dozen tracings from the office of the architect of this building, one of which being a tracing, Exhibit 33, previously referred to, and identi-

fied his handwriting thereon, where he had filled in the dates of several contracts, including the date of June 8, 1907. He also produced a book (R. 356) labeled "Contracts," pages 76, 77, of which were records of the contracts for the different portions of the work on this building, including an item under date of June 8th, for $55,000.00, as the principal contract of the Gilsonite Construction Company. Although the witness was not personally familiar with these entries, he recognized the names of practically all the contractors whose names appeared on these two pages, as having been connected with the work. He was also familiar with the handwriting of the stenographer in the architect's office, who had made the entries, and had seen the book as early as 1907. The witness also identified Exhibits 3, 22 as pictures of the Coliseum Building, the construction of which he had noticed at the time (R.352, Qs. 47, 48). He had also seen concrete distributing apparatus used by E. C. Gerhard in the erection of some of the public schools in St. Louis, including a steel boom, which he noticed particularly, although he gave no date as to this latter apparatus (R. 352, Qs. 55-57).

F. C. Bonsack, an architect, was also called as a witness. He is a son of F. C. Bonsack, deceased, the architect of this building. He located the tracings which Mr. Black discussed during his testimony, stating that he found them in the files of his father. He made a search for further photographs which he said had been taken during the erection of this building, but was unable to find them, as they had apparently been lost when he went into the Navy, due to the fact that several large boxes of records had been moved to another warehouse while he was away, and had broken open and many of the pictures and other records lost. He also identified the contract book

as one kept as an office record. He also inquired of the commercial photographer, but was unable to produce the plates from which the lost photographs had been taken.

Fount M. Woodward, beginning page 1, stated that he was employed on this American Theater Building during its erection, being superintendent of the Roebling Construction Company, which did the concreting, furring and lathing. He described the apparatus in considerable detail, stating that when they poured the mezzanine floor of the hotel the concrete was carried through chutes, a distance of 60 feet. He understood that Bankes was responsible for the apparatus. When he asked Bankes on the work how long he had had the idea, Bankes stated, "I have had it quite a while, but you know how hard it is for us fellows to tell the people in the office anything." (R. 134, Q. 35.) He also talked it over with the engineer of the Roebling Company and with the estimator for the Gilsonite Construction Company and asked if it had been patented, but was told by the estimator that it had not, and that "the idea was as old as the hills." The witness also stated that wet or "sloppy" concrete was used on this work, and that up to that time the engineering pro fession as a rule objected to wet concrete (R. 133, Q. 23). He also testified that he told Mr. Andrew W. Woodman, of the Chicago office, about this apparatus, and on his next visit to St. Louis he inspected the apparatus (R. 133, Qs. 20, 21). The witness also described briefly the concrete distributing apparatus comprising a high tower, hoist, hopper and chutes used in the erection of the St. Louis Coliseum in 1908 (R. 136, Qs. 45, 46).

Andrew W. Woodman, civil engineer, of Chicago, confirmed Woodward's testimony to the effect that he, Woodman, visited the American Theater Building while it was

under erection in the "open building season of 1907." He made a sketch of the apparatus, Exhibit 4, showing pipes on a slope, which according to some of the other witnesses was a little too steep. However, the sketches of these various witnesses agreed as to the main essentials, *i. e.*, the tower, hoist, hopper and pipes supported from the steel framework. The witness stated that he saw the concrete being carried through the pipes for a distance of from 60 to 100 feet and that there was a swivel joint on the last section of pipe enabling it to be swung around (R. 139, Qs. 6, 7; R. 143, X-Q. 35). The witness also referred to the gradual evolution from dry concrete to wet concrete (R. 141-142), and stated that the increased water was due to the reinforcing bars in the steel. The witness also had heard of a fifteen or sixteen story reinforced concrete building in Cincinnati some years before (undoubtedly the Ingalls Building) and remembered the discussions at that time with reference to it.

Henry O. Webb was another witness who was employed on the American Theater Building. He was with the Gilsonite Construction Company as foreman of the concrete work. He said Bankes was responsible for the use of the chutes and "was a fellow always of ideas of placing concrete with chutes and compressed air" (R. 179, Q. 12). He made a sketch of the apparatus, Exhibit 13, and also described it in considerable detail, including the movable lower end of the pipe line (R. 181, Q. 29). He identified the photographs, Exhibit 2, as well as the photograph of the Tootle-Campbell Building. He also stated (R. 182, Q. 48), "Practically ever since the American Theater was built I have followed nothing else but reinforced concrete; and on practically all the jobs we use the chutes." He also stated he was working at present on a factory for Bunte Bros., in Chicago, to cost between two million and

two and a half million dollars, in which they were chuting the concrete from a big tower through chutes suspended from a cable over two other towers, a distance of over 275 feet, also another line of chutes running a distance of 250 feet, after which the concrete flows to receiving hoppers and is then permitted to flow to individual buggies and is wheeled by the workmen to the forms and dumped in.

This illustrates the fact, brought out elsewhere in the record, that chutes supported from a boom have a limited use, due to the comparatively restricted area that they are able to cover, chutes hung from cables being used on the larger jobs and in many cases the concrete being dumped from buggies by the workmen, as it was about twenty years ago, for example, on most of the floors of the Ingalls Building at Cincinnati, the first tall reinforced concrete structure in the United States. This witness also referred to the change from dry to wet concrete, and the fact that even in 1910 at the Great Lakes Naval Training Station (near Chicago) the government favored dry concrete and he had some difficulty in getting the permission of Admiral Ross to use wet concrete (R. 182, Q. 47).

The witness identified three photographs of the Tootle-Campbell Building, St. Joseph, Missouri, dated August 14, 1908, August 29, 1908, and October 16, 1908, and identified it as the same building shown in one of the photographs, Exhibit 2. The witness was employed by the Gilsonite Construction Company on this work and described the apparatus as consisting of a tower, hoist, hopper with chutes hung from cables by a block and tackle and moved about sufficiently to reach the entire floor area on the successive floors.

This American Theater Building marked the beginning of a continuous period of the use of chutes in the erection

of buildings in St. Louis. In fact, if we include the logical predecessor of this building in Norfolk, Va., on which chutes were used in 1906, it may be said that the Lynnhaven Hotel in Norfolk marked the beginning of continuous use of chutes on tall structures throughout the United States, the American Theater Building having been built with chutes hung from a steel framework in 1907, the St. Louis Coliseum having been erected in St. Louis with chutes hung from a boom on a tower in 1908, the Sumner High School in St. Louis having been built by the use of chutes hung from a cable in 1909, and the Tootle-Campbell Building, St. Joseph, Mo., having been built using chutes hung from cables from a tower in 1908. In 1910 the Great Lakes Dredge & Dock Company, of Chicago, begun using pipes hung from two booms on a tower, followed shortly thereafter by widespread use on both land and water.

Plaintiffs claim the first use of pipes on the Majestic Theater Building, Los Angeles, in January, 1908, the photographs in evidence showing the pipes supported on wooden framework, and plaintiffs claim the use of pipes supported from a boom in the fall of 1908, on the Timken Building, San Diego, followed by extensive use on the Pacific Coast. Insley, one of the plaintiffs, claims to have begun the use of such apparatus about 1910 (several years before becoming a licensee of the other plaintiff, the Concrete Appliances Company), and since 1910 there has been widespread and continuous developement in the use of apparatus of this character.

TOOTLE-CAMPBELL BUILDING, ST. JOSEPH, MISSOURI, SUMMER OF 1908.

George W. Herthel, vice-president of Selden-Breck Construction Company, St. Louis, Mo., testified that his company was the general contractor for this building and sublet the reinforced concrete to the Gilsonite Construction Company. He testified that in addition to their records of this work, such as reports, contracts, sub-contracts, and so forth, they took regular progress photographs of the building, which had been in their files ever since, and he produced from his files three photographs, duplicates of which are in evidence as Defendants' Exhibit 14.

The Jones deposition (R. 386), shows that an effort was made to obtain the original plates from the photographer, but he had gone out of business and the plates were not available.

Herthel visited this building three or four times during its construction in 1908. The earliest photograph, part of Exhibit 2 (undated), was said by the witness to have been taken in the latter part of July, 1908; the other three photographs referred to are dated August 14, 1908, August 29, 1908, and October 16, 1908, respectively.

The witness described the apparatus in answers to questions 11-13. He stated briefly the chutes were suspended from one or another of several cables radiating from a tower in order to reach the entire floor area and the hopper was raised as the work progressed. The witness pointed out that the same problems are not found on any two buildings, that the shape of the buildings, the surroundings and the outfit a contractor happens to have, all determine the type of apparatus used in distributing concrete. In some cases, at the present day, the chutes are swung from overhead guy lines, or supported by boom

derricks, or placed on trestles and combinations of the three are also used. He also explained that where the work is not great enough to justify the expense of putting up a rig of this character, "you would naturally handle it in another manner, such as by labor and wheelbarrows." (See R. 333-334.)

This St. Joseph apparatus was also referred to by Webb, who was employed on the work, as elsewhere pointed out, and by Goebel, who visited the building about once a month.

In addition to the undated photograph, taken presumably in July, 1908, two of the photographs of this building (in Exhibit 14) are dated in August, 1908, five months prior to Callahan's filing date and two months earlier than the date he alleges for the use of the Timken Building apparatus. In view of the fact that Callahan in discussing his Canadian testimony, practically admitted that a cable was the equivalent of a boom for supporting chutes, we contend that even in the absence of any other defenses, this Tootle-Campbell Building apparatus is enough to invalidate the claims of the Callahan patent, on the ground that no invention whatever was involved in selecting the boom as a substitute for cables as a support for the chutes.

Sumner High School, St. Louis, Missouri.

This High School, known as the Colored High School, was built by Pelligreen Construction Company, the contract having been let September 8, 1908, and final payment made March 3, 1911, as shown by a stipulation in the Record, pp. 110-111.

Robert H. Hughes, a witness for defendants, testified regarding the use of chutes hung from a cable extending from a tower and used in building this school (R. 486).

He gave the date as the spring of 1908, from memory, but probably meant the late fall of 1908, instead, as inquiry at the Board of Education disclosed the dates which were embodied in the above-mentioned stipulation. Judging by the speed with which the excavations have been made and foundations put in in other buildings referred to in the testimony, and in view of the mild fall weather in St. Louis, this apparatus was doubtless in use before the end of 1908, somewhat earlier than Callahan's filing date.

Hughes testified that he was employed on the American Theater Building in 1907, after which he was employed on this Sumner High School. He also saw the Coliseum under construction, but did not pay much attention to it.

FRANKLIN SCHOOL, ST. LOUIS, MISSOURI, 1909.

Defendant's witness, Edward C. Gerhard, testified, beginning R. 335, that he is the president of the E. C. Gerhard Building Company, St. Louis; that he built the Franklin School and the Clark School, among other buildings. Exhibit 31 is a photograph, dated May 7, 1910, showing concrete distributing apparatus used on this building. It comprises a tower, hoist, hopper and stiffened or trussed wooden chutes supported by block and tackle, its lower end being supported by a high trestle, with additional chute sections extending therefrom. It is stipulated on page 556 of the Record, that if the witness were recalled he would testify that the contract for this school was let June 28, 1909, and that the apparatus in the photograph was put into use in the building operations prior to January 1, 1910.

Gerhard's company and the Board of Education were sued for infringement, because of the use of this apparatus, by Concrete Appliances Company, the bill of com-

plaint being filed February 23, 1910, on the identical claims of the Callahan patent in suit. As the patent only issued February 8, 1910, the plaintiffs lost no time in using this patent as a club, an inference which we believe to be justified in view of the large number of suits which were started but were never prosecuted if the defendant showed any sign of making a real contest. (See suits identified by petitioners' attorney on page 345.) Exhibit 65, a certificate of the Clerk of the Court, in St. Louis, shows that an answer was filed in April, 1910, and the cause was dismissed for want of prosecution September 19, 1911. Gerhard testified (R. 337, Q. 26) that his knowledge of the American Theater Building apparatus "came out in the defense we were preparing" in this suit. He was not familiar with the American Theater Building concrete distributing apparatus except by "hearsay" and considered that his own apparatus was original with him. Although the date of use of this Franklin School apparatus was not early enough to constitute a defense, it is, nevertheless, further evidence of an independent conception and use of the apparatus by another party. We are relying on it, in conjunction with a large number of similar cases, in support of our contention that where so many independent contractors and engineers, widely scattered throughout the United States, and without knowledge of each other's work, within a comparatively short period of time constructed substantially the same type of apparatus, representing an advance over previously used structures, such numerous instances are *very persuasive* that some underlying development in the art, such as wet concrete, for example, had suggested this improved apparatus, and that no invention is involved in the selection and use of the most appropriate equipment available.

Gerhard also testified regarding the use of similar ap-

paratus on the Clark School at an earlier date, 1906, but there is considerable doubt as to such use and defendants, after investigating further, stipulated that Mr. Itner, the architect for the School Board, would testify that he saw no such apparatus on the Clark School in 1906.

Webber Dam, Near Lyons, Michigan, 1906.

The deposition of Wm. G. Fargo (R. 494), and the stipulated testimony of Horace S. Hunt (R. 500), of the present record, are to the effect that Mr. Fargo is a civil engineer, head of the Fargo Engineering Company, of which Mr. Hunt is vice-president, that in 1906 these parties built a dam near Lyons, Michigan, the concrete being discharged from tip cars on a trestle along the sides of which were metal hoppers, from which inclined pipes led to the forms. Photographs of this equipment in several different forms are in evidence as Exhibits 54, 55 and 56. The dates are fully established by shop orders. Although no boom was used, the testimony is of interest as showing that engineers who were familiar with developments in the grain art at that period, 1906, would consider the distributing apparatus in the two arts as analogous, and not entirely unrelated, and would naturally consider grain spouts for distributing concrete. The testimony shows that in ordering this equipment, a letter dated June 13, 1906, called for a construction similar to that shown on page 463 of Shannon & Company's catalogue for grain distributing apparatus (R. 598), the apparatus being the same as that shown on page 201 of the Webster Manufacturing Company's 1901 catalogue, Exhibit 12. The apparatus also included a very simple swivel joint between the hopper and pipe of the type used in the grain art, which permitted a complete circle of

movement (R. 496, Q. 21), and was entirely successful when used with concrete, thereby showing that grain swivels could be used for concrete without any change or adaptation whatever, and would naturally be used if the particular work called for them.

Mr. Fargo wrote several articles in 1905, 1906 and 1907 relating to this and other construction work as shown on p. 498 of the Record, some of these articles being quoted in Exhibit 64.

It developed that plaintiff Insley knew all about this defense at the time of the Cincinnati suit, although it is not in the record of that suit, the witness testifying that he had known Mr. Insley since about 1912, a year or two after which Insley called on him for information regarding his early use of concrete spouting, and that he gave him some of the same photographs, which are in evidence in this case, "and other information of like nature." This was obviously about the time of the Canadian suit, which Insley was defending.

Plaintiffs in their brief emphasize the comparatively limited range of the horizontal swing of the pipes shown in Exhibits 54 and 55. However, they could swing far enough for the purpose. Fargo testified (R. 496, Q. 21) that the flange and lug swivel permitted a complete circle of movement "except as restricted by the trestle or other supporting timbers." The remaining photograph, Exhibit 56, shows a pipe which swings through a complete circle. The fact that Fargo did not use a boom does not indicate that he failed to appreciate its possibilities under proper conditions, but was due to the fact that a boom, in a case like this, would be merely an added expense.

Great Lakes Dredge & Dock Company Apparatus Developed Beginning 1906, at Gary, Ind.

The Great Lakes Dredge & Dock Company built a coffer-dam for the pumping station at Gary, Indiana, in the fall of 1906, when work on the new plant of the United States Steel Corporation was just beginning. As shown in Exhibit 17, Photograph K, dated December 31, 1906, it consisted of a mixer on a car running on a trestle, a wooden hopper beneath the mouth of the mixer and steel chutes extending into the coffer-dam, secured by ropes or wires to the bracing. This apparatus was built by W. T. McCann, a carpenter, who had been with the Great Lakes Dredge & Dock Company for about nineteen years (R. 188-196).

In the spring of 1907 this concrete distributing apparatus was used in building the concrete intakes or tunnels leading to the pumping station. The apparatus was modified by the addition of a swinging boom, from which the steel chutes were suspended, so that they could be swung from one side to the other through a considerable angle. By employing additional chute sections at the lower end of the boom supported chutes a section of the tunnel 125 feet long could be poured, that is to say, the chutes would reach 62½ feet on each side of a central position (see R. 211, X-Qs. 172-173). This boom equipped apparatus is shown in Exhibit 17, Photographs A and M.

Photograph A was taken June 19, 1907, at a time when the chutes were not being used, as that particular part of the excavation was not quite ready for the concrete. Photograph M was taken June 5, 1907, two weeks earlier and shows the actual concreting operation, the forms for the tunnel being in place and partially covered with concrete. The steel chutes were about 14 feet or 16 feet long (R. 211, X-Q. 168), and when supporting them from the

boom two of them were tied together, as shown in the photograph, resulting in a single stiff length of about 25 feet or 28 feet. The rope attached to the boom and shown in the foreground was used to pull the boom around to change the point of delivery of the chutes. The boom was added to the apparatus by Alexander Cameron, general foreman of the Great Lakes Dredge & Dock Company, assisted probably by others.

Cameron was sent to Gary in the fall of 1906 and had charge of constructing the coffer dam and intake (R. 197). When he was called as a witness, the only photograph we had found showing this apparatus was photograph A of Exhibit 17, the one showing the apparatus without the chutes, located in one of the numerous photograph albums of the Great Lakes Dredge & Dock Company. Cameron therefore made a rough memory sketch, illustrating the relation of the chutes to the boom and the car, which is in evidence as Defendants' Exhibit 18. There was an interval of more than a month in the Cameron deposition during which testimony was taken in the East and during this time photograph M of Exhibit 17 was found in the files of the Illinois Steel Company. This 1907 apparatus was used for five or six months, as shown by the testimony, and was entirely successful. Both McCann and Cameron testified that prior to the construction of this apparatus they had seen grain elevators with the grain pipe supported from a boom (see R. 200, Q. 41 and R. 199, Qs. 39, 40).

Photograph A was said by the witness to have been taken by a photographer named Christy, now deceased. photograph M was taken by A. C. Patterson, who was called as a witness (R. 319-321) and testified that he was the official photographer for the Indiana Steel Company at Gary at the time that he took photographs K, L

and M on the dates appearing thereon, *i. e.*, December 31, 1906, March 2, 1907 and June 5, 1907, respectively.

The fact that photographs A and M, showing the same apparatus, were produced from two different sources, and taken by different photographers, establishes the existence of the apparatus at the period in question beyond any doubt.

In this apparatus appears the characteristic feature of the structure in suit, that is, chutes hung from a boom for varying the point of delivery of concrete discharged from a hopper. It is true that this apparatus does not comprise a tower with a skip hoist in it. However, this feature of elevating the concrete to a hopper by an automatic dumping bucket was not only old at the time, but was standard practice, as shown by the 1906 catalogue of the Ransome Concrete Machinery Company, Exhibit 21, and the testimony of numerous witnesses elsewhere referred to. With the Ransome outfit the concrete flowed from the hopper to wheelbarrows or carts, which were wheeled by the workmen along runways and dumped. Since plaintiffs are placing great emphasis on the advantage of the boom-supported chute as displacing wheelbarrows and some of the workmen, and are also emphasizing the freedom from obstruction afforded by this chute apparatus as distinguished from plank walks or runways for carts or wheelbarrows, we call attention to the fact that this apparatus of photograph M was devised to overcome the same inconveniences, and did, in fact, facilitate the work in the same manner that it does when the concrete is deposited in building forms, as distinguished from forms in an excavation.

Cameron was asked in X-Q. 160 (R. 210) regarding the earlier necessity of supporting the lower end of the chute either on a trestle or a part of the intake forms and an-

swered in substance that such support was necessary in the case of photographs K and L, and that "we found it such hard work that we devised some other scheme, hence the boom."

The inference we draw from this and from other parts of the testimony, is that none of these employees of the Great Lakes Dredge & Dock Company considered the use of a boom with concrete chutes to be an invention, but merely an expedient to be adopted as a matter of convenience whenever the necessity arose. In some cases it was desirable and in others it was not.

Cameron testified also that he supervised the building of a scow concrete distributing plant, shown in photograph B, Exhibit 17, in the winter of 1907-1908. This apparatus, generally speaking, was similar to that used in the spring and summer of 1907, except that it was mounted on a scow instead of a railway car. It included a chute hung from a swinging boom and was used in connection with work at the Gary slip and turning basin, after which it was towed to the Illinois Steel Company at South Chicago, and was used there for further work.

Cameron says that he conceived the idea of this apparatus about the middle of the summer of 1907, when he was notified he was to take charge of the building of the concrete dock around the turning basin and slip (Q. 57). It was built in the winter of 1907 and 1908, and used beginning in the spring of 1908 (also R. 216, R-D. Qs. 214-217). Photograph B was taken somewhat later, being dated December 18, 1909, at which time this apparatus was being used on foundation work for the pumping station for the coke ovens.

The 1907 apparatus and 1908 apparatus are also identified by Stephen Creutz, Jr., assistant general foreman of the Universal Portland Cement Company, Buffington

plant, who was employed by the Great Lakes Dredge & Dock Company for a period beginning just after Labor Day, 1906. He fixed the dates of the use of the floating concrete distributor, of photograph B, by two incidents which showed that it was 1908; one was, he was married February 26, 1908, and the other was that he left the employ of the Great Lakes Dredge & Dock Company the 28th of March, 1908, after which he was an inspector for the Illinois Steel Company during the summer of 1908. He saw this apparatus during the summer of 1908.

The apparatus of this photograph was also provided at times with a counterbalanced extension or chute at the end of the main section or chute (see R. 212, X-Q. 176, and 215, R-D. Q. 205). While this is not involved as an issue in the suit, it is referred to in view of the model of a highly developed modern apparatus produced by plaintiff in open court, but not offered in evidence, which model embodied a counterbalanced chute at the lower end of the main chute, and which was referred to as originated by one of the plaintiffs, William H. Insley (R. 121, Q. 38 of Insley testimony). A similar counterbalanced section in connection with a grain spout is shown, however, in Toepfer patent 243,327, of 1881, set up in the answer, Exhibit 66. (R. 668.)

Scow distributing apparatus quite similar to photograph B was also used by the Great Lakes Dredge & Dock Company at Cleveland, Ohio, in the summer of 1908, building the dock of the Upson Nut Company. See photographs F and G, dated August 7, 1908, and also page 424 of the Engineering Record of April 3, 1909, Exhibit 25, in which publication this exact photograph is reproduced, accompanied by an article describing the work on the dock. This Cleveland development will be referred to more in detail in connection with the deposition of J. C. Alderman, of the Great Lakes Dredge & Dock Com-

pany, to show that there was no secrecy about the use of any of the early apparatus developed by said company, but that knowledge of what was being done in one city was spread rapidly to other cities in which said company operated, so that the company might have the benefit of using on all of its work, wherever applicable, the improvements developed on any one job, wherever located.

Jerome C. Alderman, of Chicago, testified (R. 281), that he was a civil engineer of the Great Lakes Dredge & Dock Company, that he had been with them since May 15, 1909, prior to which he had been with Frazier & Fox, consulting engineers, Cleveland. He was employed in 1908 in the building of a dock for the Upson Nut Company, Cleveland, the concrete work being done by the Great Lakes Dredge & Dock Company. The witness produced two photographs, F and G, Exhibit 17, showing the apparatus, which included a metal chute suspended from a boom, each dated August 7, 1908, the date being stipulated on pages 299-300 of the present record. The witness testified that as many as four additional chute sections were employed leading from the boom supported section. The apparatus is quite similar to that used by the Great Lakes Dredge & Dock Company in the turning basin at Gary (photograph B) and constructed in the winter of 1907 and 1908. This Cleveland photograph, as elsewhere stated, was reproduced in the Engineering Record of April 3, 1909, Exhibit 25.

The witness testified that he had seen tower apparatus of the Great Lakes Dredge & Dock Company similar to photographs C and D, Exhibit 17, used at Erie, Pa., by his company in the spring of 1910, and that such appa ratus involved a boom supported pipe on a tower, with hopper and other equipment. This witness also explained that the company had about 100 photograph albums in

the Chicago office, and that he had seen duplicate photographs of some of the equipment in the Cleveland office, as far back as December, 1908, although he was not employed by the company at the time. He also explained that Christy, the photographer who took the progress photographs for the Great Lakes Dredge & Dock Company, had died. This early apparatus was made mostly from lumber in the yards, or second-hand lumber, other parts of the apparatus being obtained in various different ways (R. 290, Qs. 60-63). He also explained that he was unable to locate drawings of these various concrete distributing plants, explaining that the company did not make a practice of making drawings of such equipment, although as a precaution he made a search through the files back to 1907 (R. 286-287).

The witness also identified the apparatus of a number of other photographs, Exhibit 17, and discussed them in some detail. He stated that he had something to do with getting out the 1912 catalogue, Exhibit 19. The witness also testified that their apparatus had been developed from their own experience, that they were pioneers in the designing of distributing plants of this character, that none of their chutes or booms were purchased from Insley, but on the contrary the witness had "at various times taken part in conversations of various heads of our company, in which it had been mentioned that Mr. Insley had looked over equipment which we had designed and constructed, he afterwards putting on the market equipment of similar design and character." (R. 293, Q. 71.)

E. J. Fucik, vice-president and assistant general manager of the Great Lakes Dredge & Dock Company, testified by way of corroboration of much of the testimony of Alderman and other witnesses. (R. 471.)

He was graduated from the University of Illinois as a

civil engineer in 1901, and told about the use of chutes from 1902 on through a period of several years in building bridge foundations in Chicago, the chutes being supported in various temporary ways, usually in cofferdams. He also discussed the evolution from dry to wet concrete and mentioned various discussions at meetings of the Western Society of Engineers, beginning with 1902, and various papers that he had heard read on both sides of the question. (R. 472, Q. 8.) He also brought out experiments by a university professor with reference to the expansion of steel as compared to concrete, the fact that the coefficients of expansion were not so dissimilar but what steel could be embedded in soft concrete and not crack loose when the concrete hardened. In fact, the dissemination of information of this character had much to do with the tremendous present day use of reinforced concrete buildings.

In addition to referring to the continuous use of chutes by the Great Lakes Dredge & Dock Company, the witness also referred to swivel connections which they had used on their dredges for seventeen or eighteen years.

The use of these early types of apparatus in 1906, 1907, 1908 and 1909 by the Great Lakes Dredge & Dock Company in the vicinity of Chicago and elsewhere was followed by other and continuous development work whenever special conditions arose which required special apparatus.

Photograph C shows a further elaboration of the earlier apparatus. It was used in the latter part of 1910 at the plant of the Iroquois Iron Company, South Chicago. This apparatus, the construction of which was also supervised by Cameron (R. 201, Q. 62), comprised a tower with the usual hoist bucket, which dumped the concrete into a hopper, from which it flowed through a *fifty-foot section of 12-inch pipe carried by two booms.* The hopper could

be adjusted vertically on the tower, as is clearly shown from the block and tackle supporting it, although the seat of each boom was fixed at the lower part of the tower, the booms being obviously so long that it was unnecessary to raise them during the progress of the work in hand.

Photograph D, dated December 27, 1910, Exhibit 17, is another view of the same or similar apparatus.

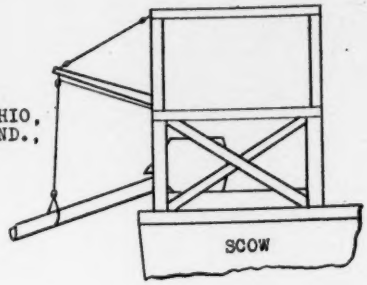
Photograph E, dated May 18, 1911, shows substantially the same apparatus mounted on a scow. Cameron testified (R. 202) that this company had been using this tower apparatus on a scow since the work of the Iroquois plant.

We call attention to the fact that this tower apparatus, with its two booms, as used in 1910 and subsequently, is the logical development of the earlier apparatus, simply modified by the addition of structural features old and well known at the time, whereby the apparatus would be adapted for somewhat different types of construction work. The 1907 Gary intake apparatus involved a mixer, a wooden hopper, and a steel chute supported from a boom, the mixer being mounted on a railway car and the concrete being poured into forms in an excavation. In 1908 and 1909 very similar apparatus was mounted on a scow for the purpose of building a concrete sea wall and building foundations adjacent thereto. When it became necessary to build somewhat higher structures, the hopper and the boom were naturally mounted on a tower containing a hoist bucket, both of the latter being standard equipment at least as early as 1906. The boom was not necessarily used by the Great Lakes Dredge & Dock Company in all cases with apparatus of this general character, as photograph I, dated May 25, 1910, taken in Cleveland, Ohio, shows a similar tower, hoist, hopper and pipe supported by *block and tackle* from the top of the tower instead of from a long swinging boom.

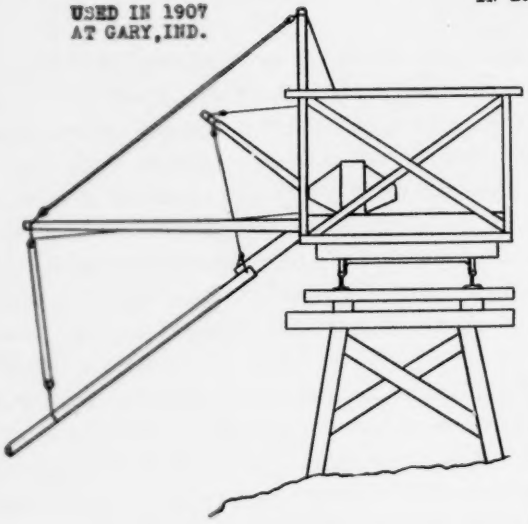
Later developments are suggested by photograph H,

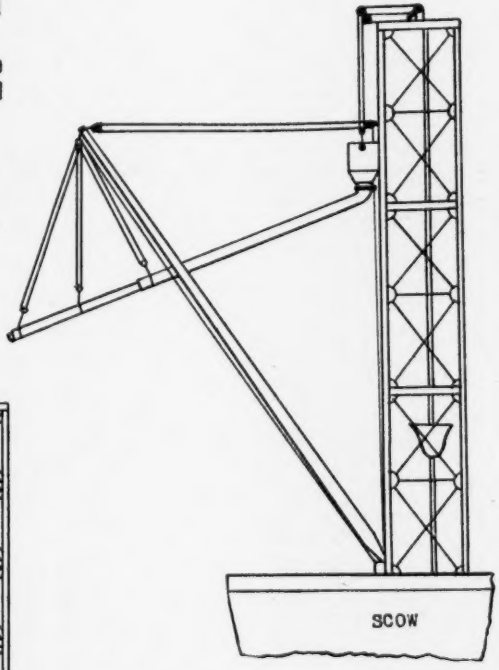
CONCRETE DISTRIBUTING APPARATUS
DEVELOPED BY GREAT LAKES DREDGE
AND DOCK CO., SEE EXHIBIT 17.

USED IN 1908
AT CLEVELAND, OHIO,
AND AT GARY, IND.,
IN 1909.

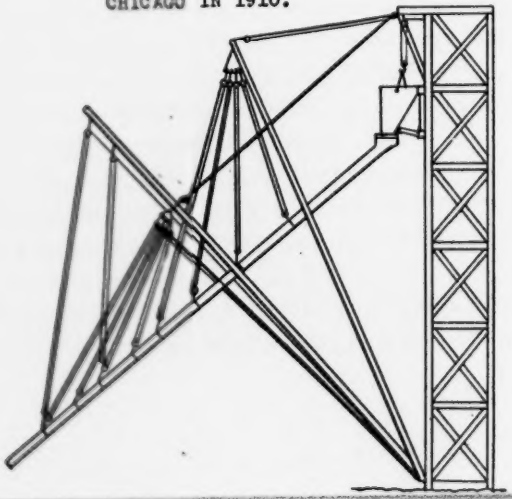


USED IN 1907
AT GARY, IND.





USED AT SOUTH
CHICAGO IN 1910.



USED AT TOLEDO,
OHIO IN 1913.

dated October 10, 1913, Toledo, Ohio, showing a *steel* tower of the Great Lakes Dredge & Dock Company, with boom supported chutes thereon, and photograph J, dated April 2, 1914, taken in Cleveland, Ohio, showing a divided boom, through which an open chute passes with a swivel extension on the lower end of the chute.

In open court we produced as a witness, Mr. John R. Williams, of New York, manager of the Atlantic division of the Great Lakes Dredge & Dock Company. He testified (R. 570) that he had been with the company since 1906; he outlined the character of the work carried on by said company, its wide geographical distribution all over the Great Lakes and the Atlantic Coast from Boston to Philadelphia, and gave some idea of its magnitude from the gross operations running anywhere from $8,000,000 to $12,000,000 annually.

His testimony is a complete confirmation of the testimony of the various Chicago witnesses from the Great Lakes Dredge & Dock Company, and a summary of their testimony, giving a very good history of the development of the concrete distributing apparatus used by the Great Lakes Dredge & Dock Company beginning in the latter part of 1906 and used practically continuously until the present time, this apparatus involving *continuously* the use of chutes hung from a boom. He also said that "It is purely a Great Lakes development" (Q. 14). This testimony will not be reviewed in detail, as most of the apparatus has been described elsewhere.

The witness referred to the "strong and continued fight on the feature of using wet concrete" at Gary, as the general superintendent for the United States Steel Corporation was opposed to it at the start.

The witness also explained that the eight different divisions of the company all kept in touch with each other

through a weekly publication and through the visits of different members of the organization, so that each division had the benefit of developments made by the others. He also pointed out that all the different types of apparatus illustrated in the photographs, Exhibit 17, were successful and that there was no instance where the tower mixer, for example, either on land or water, was started on a job but what it was completed as outlined (Qs. 16, 17).

The witness stated that his company is not financially or otherwise interested in the outcome of the suit, any more than any other contractor would be interested therein.

Petitioners have alleged heretofore that in the 1907 apparatus of the Great Lakes Dredge & Dock Company, photograph M, it was necessary to hold the boom in position at one side or the other with a guy line. However, the suggestion of petitioners' counsel during cross-examination, that Cameron found it necessary when he swung the metal trough chute around to tie it to the bracing in order to hold it sideways was not concurred in by the witness (R. 210, X-Q. 161) who answered "Not necessarily, we could hold it with a guy line and carry it on our own boom." The fact that a rope was used to swing the boom around does not necessarily mean that such rope was necessary to hold the boom in any position in which it might be left. Apparently this boom was like any other boom. Furthermore, there is nothing in the claims of the patent in suit touching this point.

Petitioners, in their brief, will not concede that this boom of the 1907 apparatus had more than a slight angular movement, and even questioned that. However, it is obvious from the photographs, that the chute could move through a considerable angle with reference to the wooden hopper which petitioners endeavor to disguise

under the name "trough" or "fixed chute." Regardless of names, however, photograph K of Defendant's Exhibit 17, shows the chute extending at a very considerable angle from this wooden hopper. While the boom had not been added at the time this photograph was taken, such addition a little later, as shown in the photograph 17-M (June 5, 1907), obviously did not limit the movement of the chute in this respect, but rather improved it. Cameron testified (R. 214, R-D. Q. 194):

> "Can you describe a little more in detail what you did with this rope hanging loosely from the end of the boom, which resulted in swinging the boom?
>
> "A. The man pulled the boom and chute around to any particular place in this section that we wanted to concrete."

The rope referred to is shown in photograph 17 M and the testimony and photographs completely controvert the statement in petitioners' brief that a limited lateral movement of the lower end of the chute could only be obtained by twisting the joint of the chutes.

Petitioners also allege in their brief that there is no corroboration of Cameron as to the date of construction of the boom supported chute, shown in photograph 17-B, in 1908 use as against the photograph December 18, 1909. However, as previously stated Creutz accurately fixes the use as the summer of 1908, by two important incidents, as previously mentioned. Furthermore, the photograph in the Engineering Record, Exhibit 25, previously referred to, is an exact duplicate of one of the photographs of August 7, 1908, about which Alderman testified. (See his answers to Qs. 4-17, pp. 282-284 of the Record.)

In the last paragraph of petitioners' brief relating to this Great Lakes Dredge and Dock development work, an attempt is made to assert that this company, despite its best efforts, was unable to develop a modern tower appa-

ratus such as shown in some of its 1910 photographs, for example, until after Callahan's filing date. However, Cameron's answers referred to, to support this inference, do not fully support this proposition. While Cameron testified, of course, that he was personally exercising his best endeavors to increase the efficiency of the work, he also emphasized that the defendants' apparatus was devised to suit different conditions (R. 212).

> "X-Q. 180. And you were constantly endeavoring to improve their operation, so as to make them more efficient?
>
> "A. As conditions would come about—in different places, under different conditions—we arranged to suit the different places."

The reason that the tower apparatus of the Iroquois Iron Company job, for example, was not built earlier than 1910 was simply due to the fact that the company did not happen to have a contract which required such apparatus. If we consider the successive equipment used from 1907 to 1910, inclusive, we may well ask *what particular step gave evidence of the great inventive genius* which plaintiffs now ascribe to the combination of the Callahan patent? In 1907 the Great Lakes Dredge & Dock company used chutes hung from a boom on a small railway car and discharging concrete supplied by a hopper; in 1908 and 1909 they used a similar apparatus on a scow with the mixer snout serving as the hopper; in 1910 they mounted a boom and suspended pipes on a tower, the pipe connecting with a hopper. A vertically adjustable hopper on a tower had been used for years for the same purpose. Did the elevation of the boom and the chute from a railway car to a tower constitute this radical improvement or was it simply the exercise of ordinary judgment and skill such as contractors are supposed to have in order to solve the various problems

presented by different contracts which they undertake? We cannot see wherein this mounting of the boom and chutes on a tower instead of on a flat car or a barge amounted to invention on the part of the employes of the Great Lakes Dredge & Dock Company. If it was not invention on their part to effect this arrangement, *neither was it invention on the part of Callahan to propose the same thing in his patent application filed January 21, 1909,* even though Callahan did it in a more complicated and cumbersome manner, resulting in apparatus which was immediately discarded and replaced about 1912 by a type very similar to this earlier Great Lakes Dredge & Dock Company 1910 rig.

To sustain the Callahan patent would be to prevent the Great Lakes Dredge & Dock Company from using their own apparatus, the development of which was begun in 1907 and has been continuous ever since, and which in 1910 had reached a perfected stage of simplicity and usefulness not attained by the Concrete Appliances Co. until a much later date.

Track Elevation.

A. H. Bannister testified, beginning (R. 470), regarding certain railway construction work in Chicago, beginning as early as 1903, including a great deal of track elevation work. During that period the witness had used a railway car mixer having a swinging boom on the end with an endless chain conveyor for conveying dry concrete to the forms. The boom was supported by a cable from a mast and would swing through nearly a half circle. A similar distributor is illustrated on page 49 of the Engineering News of February 8, 1901, comprising part of Exhibit 64.

In the fall of 1909 the witness was employed on Dock No. 2 at Ashtabula, Ohio, for a railroad, which specified the use of wet concrete. About this time a great number of the larger railroads had changed their specifications from dry concrete to wet and the witness stated there was considerable discussion of the subject at Engineering Society meetings (R. 463, Qs. 18-21). The witness found that wet concrete could not be carried up an incline by this belt conveyor he had been using, as it would flow back and he therefore built on a flat car a tower with a hoist, hopper and chute hung from a boom, using this apparatus for distributing concrete in the fall of 1909, as shown by three photographs, Exhibit 50. The date is established by certain correspondence, Exhibit 51. This or similar apparatus has been used by the witness' company, the Brownell Improvement Company, practically ever since, and is described in the Engineering News of August 12, 1915, Exhibit 52.

The witness also testified (R. 467) that he had used a series of *flexible grain* spouts for depositing concrete in foundation work.

This October, 1909, apparatus is another instance of independent invention earlier than the date of the patent, but not quite as early as the filing date, and shows the natural evolution of the art.

Grain Elevators—Deposition of Wm. R. Sinks.

Mr. Sinks, the manager of the grain elevator department of James Stewart & Company, after outlining his experience of thirty-five years in the grain elevator business, explained the apparatus used for elevating grain and distributing it through swivel spouts or pipes. He referred, for illustration, to a catalogue of George A. Moulton & Company (Exhibit 28), dated May, 1902, page

21, showing grain spouts typical of structures with which he was personally familiar (R. 158, A. 5). He pointed out that in such grain elevators the grain was elevated by an endless belt to the top of the elevator and was discharged into a receptacle called a garner, from which it flowed into a scale hopper to be weighed, hence it flowed through a series of pipes or spouts to bins, either storage bins or boat shipping bins. The spouts referred to comprise an upper spout having a swivel connection with the grain hopper, the lower end of the spout being movable in a circular path. A second section of pipe is swiveled to the end of the first section and swings about the latter so that with the two pipes any point can be reached within the combined radius of the two sections. He referred, on pages (R. 169 and 170), to a number of patents illustrating different types of grain spouts of this character, describing the apparatus. These patents are set up in the answer and will be referred to elsewhere. He also described the standard Ballinger spout for conveying grain from the boat shipping bins to the boats. The Ballinger spout is illustrated not only in Exhibit 28, but also in Exhibit 12, the Webster Manufacturing Company catalogue, which the witness referred to, and in Exhibit 15, a book entitled "Plans of Grain Elevators," published by the grain dealers. Although this book was not published until 1918, the witness referred to a number of illustrations in it as typical of grain distributing apparatus with which he had been familiar for at least fifteen years.

Mr. Sinks also referred to two blue-prints, Exhibit 11, showing grain pipes supported from an inclined cable or catenary suspension on the St. Anthony Elevator and Minnesota Linseed Oil Company elevators in Minneapolis. The witness had charge of the erection of the St. Anthony elevator in 1902, and was also familiar with the Minnesota Linseed Oil Company elevator. He referred

to page xxiv of Exhibit 15 and explained that the illustration was typical of the apparatus used for distributing concrete both before and after he came to Chicago in 1905. The illustration shows a tower, hoist and hopper intended for wheelbarrow distribution, but *the tower has a boom fastened to one corner, which boom is raised from time to time* during the progress of the work, and is used for handling steel and lumber (Qs. 110-113).

The witness also referred to the fact that in his experience he knew of the use of spouts for distributing grain, corn cobs, coal, crushed stone, sand and iron ore (Qs. 129-131). He also stated (Q. 132) that in his opinion "it would take no ingenuity to spout the concrete as all the principles used in spouting the grain could be used in spouting the concrete, and have been used since 1907-1908." He testified (R-D. Qs. 159-164) that the design of chutes is dependent on the amount of material to be passed through them in a given time and (as would appear obvious) that an experienced man would make his chutes of such size and weight of material as to properly stand the wear and tear of the particular material being used.

The witness was also familiar with the tremies for depositing concrete under water, and had seen such apparatus in Boston prior to 1907, consisting of a vertical spout suspended above the water line by a boom from a mast located in the center of a bridge pier (Q. 143).

The witness also testified that the Insley Company and the Lakewood Company had quoted him prices on concrete distributing apparatus (of the type involved in this suit) and that he found the prices "very high," this opinion being based on his experience in purchasing steel spouting for grain elevator work This shows that the plaintiff and its licensees have been making the most of their alleged monopoly while it lasts.

Mr. Sinks also testified that grain elevator designers and contractors were somewhat in advance of architects in the use of wet concrete. He stated that prior to 1904-1905 architects demanded that concrete be mixed very dry, but that grain elevator designers and contractors "were a sort of law to themselves" and were the first to use what is known in the trade as "wet" or "sloppy concrete." He ascribes this early use to the employment of special patented *forms* used in building grain elevator tanks, necessitating the use of concrete in a liquid state (Q. 240). He also stated that in such work, with a few exceptions, it was not feasible to use chutes hung from a boom, but that the standard method of wheeling in concrete carts, used for many years, was still employed by him. This situation was also due to the great expense and the first cost of spouting, towers, etc., in the modern apparatus (Qs. 42-50).

GRAIN ELEVATORS—DEPOSITION OF R. H. FOLWELL.

Mr. Folwell is an engineer and contractor of unusual experience in the designing and building of grain elevators. His deposition (beginning R. 478) shows that he was graduated from Cornell University in 1894 and after some preliminary experience designed the elevator for the Great Northern Railroad at Superior, Wis., in 1900.

This elevator was equipped with a downwardly inclined spout capable of swinging from side to side 180° and supported by a horizontal boom also pivoted to swing through 180°. This apparatus is shown in Defendants' Exhibit 29, blue-print WG 575, one of the blue-prints of the Webster Manufacturing Company, of Chicago, by whom the apparatus was manufactured.

Mr. Folwell was chief engineer in charge of the design of this Great Northern elevator, the design being worked

out jointly with Mr. Bellinger, patentee of the Bellinger spout patent No. 605,375 of 1898. The blue-print referred to shows a typical Bellinger installation, such as is shown also in the catalogue of George Moulton & Co., Webster Manufacturing Company and the book entitled "Plans of Grain Elevators."

Mr. Folwell was also generally familiar with the modified Bellinger apparatus shown on some of the other blueprints in which the boom is inclined upwardly, knowing that there was such an installation at New Orleans and Portland, Me., without having actually seen the installations and having seen a similar installation at Montreal, which, however, being outside of the United States, is of general interest only, this being of interest merely as a corroboration of other testimony.

Mr. Folwell also identified the Barnett & Record blueprints, Exhibit 11, which drawings were made under his direction and show his long-hand initials "R. H. F." put on them about the time they were made. Sheet 89 is dated February 7, 1902, and sheet 58 is dated October 22, 1904.

Mr. Folwell also "checked over" the original drawings from which the blue-prints of the B. & O. Ry. coal dock, Exhibit 30, were made. This coal dock was built in 1900 and shows a steel coal chute mounted to turn about vertical axes on a bracket or bolster pin, and also to swing up and down on a horizontal axis, this steel trough being arranged to receive coal from a hopper and being supported at its outer end by a steel cable, which permitted it to swing from side to side through a small angle. There was no necessity for swinging it through a full half-circle as in the case of the grain spouts. Mr. Folwell pointed out, however, that it would have been a simple matter to have increased the swing to a full half-circle had such a swing been necessary (R. 483).

Mr. Folwell was familiar with the evolution from dry to wet concrete and was of the opinion that wet concrete had been introduced by grain elevator engineers because of the narrow walls of the elevators and the use of sliding forms (Q. 34). He had also heard of the patent on wet concrete, which was discussed in the Engineering Record of February 14, 1914, and May 16, 1914 (see excerpts in Exhibit 64). The issuance of this patent shows that the Patent Office recognized the change from dry to wet concrete, issuing a patent on it No. 939,072, November 2, 1909, to a party named Ney, under the impression that wet concrete was novel. This laxity on the part of the Patent Office formed the basis of severe criticism appearing in the engineering magazines referred to, and Mr. Folwell stated "the patent caused a great deal of amusement among engineers and contractors, especially those who were engaged in building grain elevators, because for several years before the patent was issued we had been using wet concrete." This patent was afterwards made the basis of a suit in the Seventh Circuit, the patent being held invalid, although not reported. The patent comprises pages 846-848 of the record

Mr. Folwell, in answer to Q. 44, explained the devices shown on page XI, Exhibit 15, of the book entitled "Plans for Grain Elevators." This apparatus consists of a pipe hinged at the top so it may swing outwardly from the boom and supported in an inclined position by a diagonal frame or support, in other words, it shows a chute supported from beneath by an inclined boom, defendants' apparatus of the third type including a similar inclined prop for the chute.

Mr. Folwell also identified the swivel grain spouts shown in a number of the patents set up in the answer, *i. e.*, Edwards, Robinson, Parker and Bird. He also

pointed out that it was a practice as early as 1905 to raise the hopper from time to time on a concrete hoisting tower by means of a tackle or chain hoist (Qs. 46-47).

GRAIN ELEVATORS—DEPOSITION OF L. A. STINSON.

Mr. Stinson of Chicago testified that he had had twenty-five years' experience in the erection of grain elevators, his deposition beginning on R. 387. He was the engineer of the 1905 New Orleans elevator for the Illinois Central illustrated in some of the blue-prints comprising Exhibit 29.

The tracings corresponding to blue-prints G-1184 and F-825 were made under his instructions and from some of his sketches in New Orleans, and some of his long-hand printing appears on the drawings. He testified that the apparatus was made by the Webster Manufacturing Company.

These blue-prints, particularly G-1184, show an inclined spout supported from an inclined boom and capable of swinging from side to side through nearly a half-circle (170°, p. 400) and dated in June, 1905. The witness testified that 1905 was, in effect, the date of the work. He explained (Q. 5) that these spouts had to be very long in order to reach a second ship where two ships were moored side by side at a dock and that "the spout and boom and fixtures shown on the drawing were worked out to meet that requirement." The witness was also familiar with a similar inclined spout and inclined boom used on the East Side Elevator Company of Toledo, Ohio, having made frequent trips to Toledo and having seen the apparatus in question, although not recalling the date. The date on the blue-print is 1900.

The witness also produced two additional tracings,

blue-prints from which are in evidence as Exhibit 38. They show an elevator built in 1901 in Portland, Me., also comprising an inclined spout supported from an inclined boom and capable of swinging through a sufficient angle to enable a ship to be loaded. The spout in this case, as in practically all others, is swung up against the side of the elevator when not in use to avoid interference with the ship's rigging and when in use is swung out at a right angle to the face of the elevator, *i. e.*, about 90°. Because of special local conditions this particular spout did not swing both ways from mid-position, as it answered every purpose to have it swing one way only (p. 402, R-D. Qs. 162-163). A cut of this apparatus appears in a later section of this brief describing "*Double Use.*"

There is considerable cross-examination with reference to the details of the New Orleans apparatus, defendants' counsel apparently endeavoring to establish the fact that the spouts could not swing a half-circle in a normally inclined position of about 45°. The questions were confusing, because in many cases they assumed conditions which did not exist and the cross-examination becoming unnecessarily prolonged plaintiffs' counsel was invited, if he did not agree with the witness' statements, to produce a model (p. 398) demonstrating wherein the spout and boom would fail to swing the full amount. No such model was produced and we fail to find anything in the blue-prints which suggest anything other than an operative construction. This witness not only testified that *he installed the apparatus in 1905* and that it did work, but that he has seen this New Orleans apparatus since on several occasions, that there are *51 spouts* and that all of them are performing this very function (R. 400, X-Q. 143). This evidence was not rebutted.

The witness also testified that inclined grain spouts

supported by inclined booms had been seen by him in Southport, La., in 1896 and Newport News, Va., in 1900 (Qs. 39-40). He testified furthermore that he knew of no reason why such grain spouts as were in use in Portland and New Orleans could not be used for spouting concrete, "provided the angle was sufficient and the concrete was mixed at the usual consistency." He explained by this that concrete was made much wetter today than twenty years ago when the Portland elevator was built and he illustrated the effect of the increased amount of water used (Qs. 42-47). He brought out on recross-examination (p. 403) that he devised the particular apparatus of the 1901 Portland elevator, Exhibit 38, that "*spouts had always been handled by the ship's gaffs or booms,*" and that he "merely *transferred* the ship boom to the side of the building, making it lighter and almost copying it identically."

The witness also stated that as early as 1907 he had seen a counterbalanced spout used for grain. This testimony is also corroborated by a patent to Toepfer, 1881. Mr. Insley, one of the plaintiffs, stated that he originated the counterbalanced chute for concrete. If so, we submit that his work was a mere adaptation of this prior grain apparatus and was necessarily limited to mere matters of engineering design.

The witness was also familiar with the common early practice of raising the hopper on a tower as the building became higher and the common early practice of raising a boom from time to time, particularly when used for hoisting re-enforcing steel. He had also seen the apparatus of the Great Lakes Dredge and Dock Company illustrated in their catalogue, Exhibit 19 (pp. 26-29), and had visited South Chicago about 1910 or 1911 and had seen the concrete distributing apparatus used in building

the Iroquois Iron plant (R. 394, Q. 72.) He had also seen the B. & O. coal chutes illustrated in Exhibit 30.

GRAIN ELEVATORS—DEPOSITION OF CARL T. ANDERSON.

Carl T. Anderson, of Chicago, testified (R. 321) that he was a civil engineer with the Webster Manufacturing Company, Chicago; that he had been with them in 1892 and 1893 and from 1919 to date. He identified their catalogue, Defendants' Exhibit 12, published in 1901 and stated that all the devices illustrated therein had been made and sold. The company manufactures transmission machinery, grain elevator machinery and conveying machinery in general. The witness produced original tracings, blue-prints of which comprise Defendants' Exhibit 29, illustrating the boom supported pipe for the Toledo Elevator, 1900; the Great Northern Elevator, Duluth, 1901, and Illinois Central Elevator, New Orleans, 1905. The witness had seen the grain spouts on the Toledo Elevator and the New Orleans Elevator a number of times. Tracings were produced under his order by the librarian from the company files, although the witness was not with the company from the time the original drawings were made. The witness described several different types of swivel connections for grain spouts and described the apparatus of the various blue-prints. He also testified that he had seen spouts similar to Defendants' Exhibit 30, Baltimore & Ohio Coal Dock spout prior to 1907, used for coal, ashes, stone and various purposes.

He also produced a press copy book from the company vault, and other data containing copies or press copy reproductions of shop orders and bills, dated in 1900 and 1901, relating to the Duluth and Toledo elevators.

One of these items (Q. 57) for the Duluth Elevator shows that 16 spouts were sold for $110.00 each. Even

allowing a liberal margin for a tower, hoist, hopper and boom, it will be seen that the total cost of a concrete distributing outfit on the basis of this price would make the Insely figure of $3,500.00 look very exorbitant, and would confirm Mr. Sinks' testimony that Insley's apparatus was sold for an exorbitant price as compared to what the witness was paying for grain distributing apparatus of analogous construction.

The witness, on cross-examination, was moved to an admission that there was some limitation in the swing of the grain spouts on the New Orleans Elevator, but in this he was mistaken. Stinson, who designed the apparatus and erected it, testified that there was no such limitation and from a careful examination of the blue-prints we are unable to see that it exists. In fact, during Stinson's examination we challenged plaintiffs' counsel to rebut Stinson's testimony by producing in open court a model based on these blue-prints, demonstrating the alleged limitations in the device, which, of course, plaintiffs were unable to do.

Prior Patents.

Defendants called no expert to discuss the prior art patents, as they are simple and require little explanation. A number of them were discussed by some of the witnesses, who testified regarding the development of apparatus for distributing grain, Messrs. Sinks and Folwell, for example. Although a number of these patents are the same as those relied on in the Cincinnati suit, there was no testimony in that suit to explain the relation of said patents to the practical art, as there is in the present suit.

The Toepfer patent No. 243,327, of 1881, shows a counterbalanced chute suspended from a hopper in connection with a malt kiln (R. 668). The Edwards patent, No.

366,468, of 1887 (R. 670), shows a barge having a dredging pipe supported from a main boom G, and a smaller frame or supplemental boom E, adapted to swing from side to side, the construction with reference to these two booms being very analogous to the drawing of Fig. 1 of the Callahan patent. The patents to Robinson (R. 693 and 714), Bird (R. 707), Parker (R. 811) and a number of others, relate to swivelly connected pipes used for distributing grain to any portion of the area within the combined length of the two or more pipes. The pipes are supported by several different types of braces or booms, as will be apparent from a glance at the drawings.

The Clarke patent 714,150 of 1902 shows two booms 177, 178 and two extensible conduits (R. 742).

The Clarke patent on pages 798, 799 of the record shows even the refinement of ball bearings for the swivel connection, this being one of the developments which the builders of the Majestic Theater (plaintiff's associates) in January, 1908, thought was an important advance as evidenced by the letter of Mayberry & Parker reproduced on the middle page of the catalog, Defendant's Exhibit 59. This letter is significant in that it refers to *ball bearings* but makes no mention of a boom although plaintiffs now contend that a boom was used on this work.

The Bellinger patent No. 605,375, of 1898, discussed at length in the Folwell deposition (R. 481, Q. 18 and R. 710), is also found among the patents in the answer as well as Record patent No. 667,335, February 5, 1901, showing the apparatus of the Baltimore & Ohio coal dock (R. 720).

The detail of a stiffened pipe or chute (used by defendants in Philadelphia in 1920) was of course old long before Callahan's time as shown by said Bellinger patent of 1898, in which the lower pipe 5 is stiffened by

plates 8, shown in the drawing and described in the sentence on page 1, beginning at line 42. The pipe referred to is swung from a boom like most grain distributing pipes used for the last twenty years or more.

In addition to the various horizontal and inclined booms projecting from the side of a building, as shown in the many patent and blue-print exhibits in the record, it will be noted that the specific horizontally swinging boom 72 on the *top* of the tower (such as was used by Smith on the St. Louis Coliseum rig prior to Callahan's filing date) is shown in the Lonney patent filed November, 1906, found on page 853 of Record. It is also described on page 867, beginning at line 104. This shows that the several types of booms were well-known equivalents.

The British patents show various types of apparatus for handling material of different character. The foregoing patents are not described at great length, as they bear out the testimony of numerous witnesses to the effect that swivelly connected pipes supported by booms have been used for conveying almost every conceivable kind of material for many years prior to Callahan's filing date. However, we request that these patents, which are printed in the record and in evidence as Exhibit 66, be examined at least as to the drawings, which will be understood at a glance. Even in the absence of these patents the court will doubtless take judicial notice of the use of booms for an almost indefinite period. In fact, during the trial the court commented on the use of booms on a ship as a well-known example of such use. The fact that concrete was not conveyed by the apparatus disclosed in the foregoing patents at a much earlier date than it was, is due to the fact that the concrete did not have the proper consistency. The use of similar apparatus thereafter for distributing concrete does not represent an improvement

in the *apparatus*, but an improvement, or change at least, in the *character of the concrete.*

Our contention is, therefore, that even if the patentee had been the first to adapt this old apparatus to this somewhat new use, no invention would have been involved in the minor changes necessitated by such adaptation, since the *real advance* in the art was made by *others* and rendered the new use of the old apparatus perfectly obvious and one which the public has a right to use without paying tribute to some alleged inventor.

See *Shelby Steel Tube Company* v. *Standard Steel Tube Company*, 286 F. R. 863, Third Circuit Court of Appeals, February 26, 1923:

> "Even if Nicholson were the first to conceive the four steps in the order named and the first to embody them in a method and reduce it to practice, his method, we think, was but the natural answer to a new call made by the automatic plug-mill when it came into the industry."

Prior Publications Other Than Patents.

Prior to the filing date of the Callahan patent, January 21, 1909, the magazines and books in the Engineering Libraries throughout the country were replete with articles discussing the merits of depositing concrete by chutes and arguing the merits of wet *versus* dry concrete. Exhibit 64 is a collection of excerpts from a number of typical publications of this character, including the Engineering News, the Engineering Record, and various text books. To avoid too voluminous a brief, we shall refer only to a few of these excerpts, but we ask careful consideration of all of them.

The Engineering News of June 2, 1892 (Exhibit 64), on page 54 illustrates and describes a concrete plant at Cascade Canal, Ore., in which a stiffened or reinforced pipe

was used to convey concrete from a dumping bucket at the upper end to a car at the lower end. This trussed or stiffened pipe is quite analogous to defendants' trussed chutes used in Philadelphia, as a comparison will show.

On page 544 it is stated that it "was trussed horizontally and vertically by four stays each made of two strands of 5/8" steel wire rope." Compare this with the cut on page 18 of petitioner's brief.

The Engineering News of February 28, 1901, page 149, contains an illustration of a mixer on a railway car with a boom capable of swinging nearly 180°, the boom being in the form of an endless belt or conveyor for concrete.

The Engineering News of October 17, 1901, contains an article relating to the Cambridge bridge, with a portion on page 283 referring to the use of tremies, that is, pipe sections nested one into the other, in a vertical line for depositing concrete under water.

The Engineering News of December 25, 1902, on page 537, described the use of chutes in connection with the Rock Creek bridge in Washington, D. C.

The Engineering News of July 30, 1903, on page 93 describes the hoist tower, dumping bucket, hopper and chutes shown in Fig. 14, and illustrating the apparatus used on the Ingalls Building in Cincinnati.

The Engineering News of March 30, 1905, page 331, shows a concrete spout depending from a bridge.

The Engineering Record for July 6, 1907, on page 13 describes a 25-foot boom carrying a 20-inch traveling belt conveyor for distributing concrete along a 90-degree arc.

The Engineering Record of May 16, 1914, discusses on page 551 the issuance of the Ney patent, covering in substance, wet concrete, and commenting on the extraordinary condition in the Patent Office which would permit the issuance of such a patent, and stating that the patent had been held invalid by Judge Sanborn, November 12,

1913. Although these dates are too late to be of interest in connection with anticipation, this patent is referred to for the purpose of showing that even the Patent Office thought wet concrete was novel at the time the patent was applied for, in July, 1909. It also confirms the fact that the Examiners are often apparently unaware of practical developments in the art outside of the Patent Office. Defendants' witness Folwell stated that this patent caused considerable amusement among elevator engineers, just as considerable surprise and astonishment must have been caused when engineers and contractors in Cincinnati and St. Louis, for example, familiar with the work on the Ingalls Building, the American Theater Building and the St. Louis Coliseum read the decision of the Circuit Court of Appeals in Cincinnati upholding the Callahan patent and stating (262 Fed. 958, p. 965) that:

> "The quasi automatic elevation and distribution of wet concrete under the varying conditions of progressive building and by a single apparatus was an entire novelty. No one had tried to do it; apparently, no one had thought of it; it was useful in a very high degree."

"Mines and Minerals" of December 3, 1903, contains some pertinent comments on the cheapness and convenience of placing concrete by chutes; "Concrete and Reinforced Concrete Construction," by H. A. Reid, 1907, contains a reference to an 11-inch pipe suspended from a truck that moved laterally on a frame for depositing concrete in the harbor bridge foundations; and "The Michigan Engineer" of 1906 contains an article by William G. Fargo with reference to the use of wooden spouts and hoppers. Mr. Fargo was one of defendants' witnesses.

"The Engineering News" of December 5, 1902, contains several paragraphs explaining how the ingredients are kept from separating when concrete slides through chutes.

"The Transactions of the American Society of Civil Engineers" for 1904 contains a discussion on wet concrete in conjunction with the experiments on the coefficient of expansion of steel; and "Concrete Plain and Reinforced," of December, 1909, by Taylor, contains a discussion of the relative merits of jelly-like concrete and mush or sloppy concrete.

In Gilbreth's book, "Concrete System," 1908, is an article referring to four 72-foot booms used on a New York building, which booms could be raised to higher positions without delay. This is the same building referred to by Mensch in his deposition.

These and other articles in the same exhibit, together with other publications in evidence, show that if a contractor were well informed in 1907 as to the developments in the use of wet concrete, pipes and chutes throughout the United States, he could hardly have failed to try such equipment at one time or another during his work, where a condition was met which provided the opportunity.

We call attention to Exhibit 52, a complete copy of The Engineering News of August 12, 1915, containing four articles describing different types of concrete distributing apparatus involving chutes. On page 321 we find the following editorial under the heading "Concrete Chuting Predominant":

> "In this demonstrated success, so widespread that the chuting system has practically driven out of use every other method of placing concrete, it is somewhat curious that a former criticism seems now to have been forgotten. A year or more ago when the chuting system was first booming there were many and frequent complaints that its use required an excess of water in the concrete, and an excess of water was regarded as a set-retardant and a reducer of early if not of final strength. This complaint naturally enough came from the engineer or owner who

had let the concreting for a fixed price and not from the contractor who was interested in the cost reductions the chuting method was bound to show. Today, while this critisim is still occasionally heard, its force must certainly have abated, else the concrete tower and chute would not be the predominant feature in most concrete jobs."

These articles also confirm our contention that the change from dry to wet concrete was a gradual evolution and met with considerable opposition, which doubtless explains why more contractors did not use grain-spouting apparatus for placing concrete at a much earlier date than 1907, for example, being prevented from doing so by the opposition of the architects and others in authority.

MAJESTIC THEATER BUILDING, LOS ANGELES, 1908.

Defendants took depositions to show that Emtman devised a system of pipes for distributing concrete during the erection of the Majestic Theater Building, these pipes extending from a vertically adjustable hopper on a tower, very much like the pipes used on the American Theater Building in St. Louis the year before, beginning about July 1st, 1907. The use of similar but smaller pipes on the Majestic Theater began in January, 1908, nine months earlier than the date Callahan claimed he was entitled to, when his application was pending in the Patent Office during 1909. Defendants also took this testimony to determine whether a *boom* was used to support the pipes, such apparatus as was employed, being used seven months earlier than the boom suspended chutes used on the St. Louis Coliseum in August, 1908.

Following defendants' depositions, plaintiffs took depositions apparently for the purpose of establishing that this Majestic Theater apparatus was the invention

of Callahan, not Emtman, thereby attempting to establish a date earlier than anything claimed heretofore by Callahan. This was obviously for the purpose of ante-dating by a few months the St. Louis Coliseum apparatus, which had been established by defendants as a complete anticipation of Callahan's patent, and shown beyond a reasonable doubt, by dated photographs, to have been built in the late summer and fall of 1908.

Both parties therefore rely on this Majestic Theater Building to help prove their case. Before describing the system of pipes used on this building, however, we shall refer to the two sworn preliminary statements filed in the Patent Office by Emtman and Callahan in the summer of 1909. These statements are reproduced in the form of a chart on a later page of this brief.

Emtman stated *under oath,* July 31, 1909, that he commenced the construction of full-sized apparatus during the month of November, 1907, and he completed it about the latter part of December, 1907, "and that the said apparatus was first successfully operated during the latter part of December, 1907, or the early part of January, 1908, in Los Angeles, California; that he has since continued to use the same, and that since then he has manufactured seven other similar apparatus." Callahan, on the 9th day of August, 1909, made a *sworn statement* "that he made a full and complete apparatus beginning with the 18th of September, 1908, and completing the same on the 11th of October, 1908; that inasmuch as the apparatus was then complete and successfully operated he considers that he reduced the invention to actual practice not later October 11, 1908; that the invention has been successfully used in the erection of structures in various places."

As we shall point out, the testimony shows without question that the Los Angeles building on which pipes

were first used, beginning in January, 1908, was the Majestic Theater Building, and that Emtman was general superintendent of the work. It also shows that in the late summer and fall of 1908 and the spring of 1909, Callahan was employed on the erection of the Timkin Building in San Diego, and there used a pipe encased in a swinging lattice work, which he calls a "boom," and which is illustrated in his patent.

The patents of both Emtman and Callahan, being owned by Concrete Appliances Company, one of the plaintiffs, since prior to their issuance, and plaintiffs' apparatus having been developed in California, defendants, with their Philadelphia location, realized the difficulties to be encountered in entering their opponent's home territory for the purpose of proving a situation opposed to the interests of plaintiffs, particularly in a state where the "native son" idea is so generally acquiesced in. As anticipated, considerable difficulty was encountered, even though defendants' representative appeared on the scene for the simple purpose of proving that Emtman and Callahan, when they swore to their preliminary statements in 1909, *were telling the truth,* and for the further purpose of confirming the honesty of Callahan when he testified, several years later in the Canadian suit, that he *first* used his invention as a completed apparatus on the Timkin Building in San Diego.

Among others we called Mr. H. W. Bryson, a stockholder and formerly president of the Concrete Appliances Company; Theodore Emtman, the patentee, who was a former stockholder, and L. A. Parker, architect and engineer in charge of the erection of the Majestic Theater Building.

As we anticipated, Emtman, who in 1909 swore to the January, 1908, date of invention, was stricken with a lamentable lapse of memory and was *unable to recall* any

particular work he did on the Majestic Theater Building, was unable to recall the year in which the work commenced, was unable to recall that he gave any directions or advice to others in connection with the work, or whether he had ever talked with Lee Callahan about improvements in the distribution of concrete; was unable to recall having been in interference with Callahan in the Patent Office, was unable to recall whether he received any stock from Concrete Appliances Company, stating further that it was none of our business, and *was unable to recall that he ever signed a preliminary statement or anything in connection with it,* even when shown a certified copy of such statement.

As we anticipated further, plaintiff, after we had examined Emtman, called Callahan as a witness, whose memory had *improved* so in the eleven-year period from 1909 to 1920 that he was able to remember not only the original "first use" of his apparatus on the Timkin Building in the fall of 1908, but he was even able to remember an *earlier first use* of said apparatus on the Majestic Theater Building in January, 1908, including a boom. He remembered further that he first arrived in Los Angeles about November 26, 1907, he remembered the substance of certain conversations with Mr. Bryson within a few days thereafter, the approximate length of said conversations, that he started to work for The Engstrum Company the day after Christmas, 1907, and substantially what work he did the *first* day, the *second* day, and the *third* day, although he had no time book or diary to enable him to fix the dates or the circumstances.

The U. S. Supreme Court in an analogous situation, said in *Clark Thread Company* v. *Willimantic Linen Company et al.*, 140 U. S. 481, May 25, 1891:

> "No person accustomed to weigh the credibility of human testimony can fail to perceive the stress

under which this evidence was given. . . . We feel bound to put this strict construction upon the patentee's evidence because such testimony given for the purpose that this was, is necessarily subject to the greatest suspicion, however honest and well intentioned the witness may be. . . . We conclude, therefore, that there is no proof on which reliance can be placed that Conant made his alleged invention before the publication of Weild's patent in England. After Weild's patent was introduced into the case, showing with certainty the date of its publication, and such date anterior to the issue of Conant's patent, it was incumbent on the plaintiffs, in rebuttal, to show, if not with equal certainty, yet to the satisfaction of the court, that Conant's invention preceded that date. *St. Paul Plow Works* v. *Starling* (*ante,* p. 404), decided this term."

"It is also clear that Conant was not a pioneer in this department of invention, and that he must be held strictly to the terms of his patent and was entitled only to the specific form of device described and claimed therein."

If this Majestic Theater Building were our only defense and the usual burden was on us, as defendants, to prove invention by others prior to the filing date of the Callahan patent, the case as made out for us by witnesses called from among plaintiffs' officers, stockholders and employees, would not be very reassuring. Fortunately, however, **the burden is not on us to prove the use of boom supported chutes on this Majestic Theater** operation, early in 1908. On the contrary, our proofs regarding the boom supported chutes used on the St. Louis Coliseum in August, 1908, five months earlier than Callahan's filing date, are so firmly established that **the burden of proof has been shifted to plaintiffs to show an earlier date of invention than the date of the Coliseum,** and this burden must be discharged by the plaintiffs by the same strict weight of evidence that was required of defendants in establishing the Coliseum prior use.

If it develops from the testimony, therefore, that the pipes on the Majestic Theater Building were *not supported by a swinging boom* but were otherwise supported, plaintiffs will have failed to carry their date of invention back of the Coliseum date, and such apparatus as was used on the Majestic Theater in January, 1908, would be substantially the same as what was used in St. Louis on the American Theater Building in the summer of 1907. If, on the other hand, a boom *was* used on the Majestic Theater Building, *the burden is still on the plaintiffs to show that it was added to the combination by Callahan and not by Emtman.* In other words, it is not enough to show merely that a boom was used but that the invention, if it is to be called such, was specifically Callahan's invention and not the invention of any one of a dozen other employees of the company.

We place special emphasis, therefore, on the fact that if, in our testimony, we have raised any substantial doubt as to the use of the boom, as part of this Majestic Theater apparatus, or have raised any substantial doubt as to who was responsible for the use of a boom in case it were used, plaintiffs' case must fail.

Our first witness was Mr. Bryson, manager for F. O. Engstrum & Company, from 1904 to 1916 (assignee of the Emtman application before it was filed), a son-in-law of Mr. Engstrum, Sr., deceased, and a brother-in-law of the son, Mr. F. E. Engstrum, now president of the Concrete Appliances Company, and himself a former president of Engstrum & Company (R. 427, Qs. 12-13).

Our direct examination, as between the activities of Callahan and Emtman in connection with the American Theatre Building was limited to questions regarding Emtman. The answers showed that he directed the erection of the American Theatre Building and that he had many talks about that time, as well as prior thereto, with

Mr. Bryson, about "the feasibility of running concrete by gravity" (R. 426, Q. 5).

Our contention is that the *real problem* in connection with this work, as well as with the prior buildings erected in St. Louis, Norfolk and Cincinnati, *was not the apparatus for supporting the chutes,* as numerous different types of supports were at hand ready to be adopted, depending upon the character of the undertaking, but related instead to the *consistency* of the concrete and the practicability of permitting it to *slide* through troughs or pipes without partial *separation* of the constituents. This contention is confirmed by the answer to this question 5, just referred to, as Bryson states that this was "a very difficult feature" and also question 10:

> "One of the principal drawbacks from an engineer's standpoint was the mix or concrete to flow by gravity. The mix or concrete to flow by gravity was different than any engineers had tried before. The question in everybody's mind was whether the rock would separate from the cement or gravel, and *many a conversation was had on the lines of getting a mix irrespective of apparatus* or whether it would flow by gravity or not."

Other discussions of the problem by plaintiff's associates at that time appear in the record.

The point we wish to emphasize is, if these parties solved *any* problem at the time, they solved the problem of what proportions of stone, sand, cement and water to employ in order that the concrete might flow without separation of the ingredients, what angle of inclination the pipes should have, how large they should be to prevent clogging, and whether, in fact, pipes should be used at all as distinguished from open chutes.

Giving plaintiffs the full benefit of their later testimony and assuming that they solved these problems during

the year 1908 and subsequently, for they were not solved immediately by any means, we contend that they were not the first to overcome these difficulties, but could have handled the wet concrete successfully from the very outset had they been familiar with developments in the middle west and in the east for a period of several years preceding. The Los Angeles depositions, not only defendants' but also plaintiffs', show that these Los Angeles parties *were not well informed* on current engineering developments as brought out in numerous engineering publications, in which the use of wet concrete had been discussed pro and con for years, and sucessful use, by a large number of concerns scattered throughout the eastern half of the country, fully demonstrated, as for example, on the Ingalls Building in Cincinnati in 1902.

The inference we draw from the testimony of this particular Los Angeles witness is the same as the inference we draw from the testimony of our other witnesses who testified to earlier uses in the eastern half of the country, *i. e.*, that in every case there was a considerable period of discussion and experimentation with reference to the consistency of the concrete, and after this problem was solved, the use of the apparatus was *incidental* and resolved itself merely to a question of *selection from the available equipment*, whether previously used for delivering concrete, grain, coal or any other material.

The Emtman apparatus, as shown in his patent embodies a pipe hung from a horizontally swinging boom, the latter being supported by cables from a vertical, rotatable mast on the top of the tower. Mr. Bryson states that this rotating mast was used, particularly on some of their later work, but admits that the particular rotating mast detail was not developed until *after* such

general features as were developed on the Majestic Theatre Building.

Bryson endeavors to make it appear that a boom was used as part of the Majestic Theatre apparatus (see R. 429, Q. 24):

> "Q. 24. Was the rotatable mast used in connection with the cement work of the Majestic Theatre?
> "A. Well, you might term it that. It was a boom. Part of it was a boom; afterwards it developed into a more perfected boom. My recollection was a stick about 20 or 25 feet long that was so constructed that it could vertically move with the pipe quite a degree away from the tower swinging movement and the pipe was hung from a guy wire from tower, which gave it that oscillating movement. A very crude method of what has now developed into the gravity system and particular feature of it was developed by Mr. Callahan on that particular job. That is, it was under his supervision. He was under the working foreman on a job. It was explained to me he had had some previous experience on gravity system and was allowed to put one up there. That was in 1907 about the latter part and the first part of January, 1908, and it was continuously used and improved as we went along. We first started with a 4-inch pipe and they found that clogged; then we got a 6-inch and found that clogged; then we got an 8-inch pipe all with this little boom or pole or little arm and pipe suspended from tower by cable and swivels so as to get an oscillating vertical movement. That was very crude compared with drawings that came after so far as a whole gravity system was concerned, which had to be developed from different angles, so we could use it from a practical standpoint."

Bryson, it will be seen, took the opportunity to volunteer statements regarding *Callahan's development* of the boom. The answer itself is somewhat confused with reference to a rotatable mast vs. boom, and the witness later admitted "that he had the mast confused with

Callahan's arm or boom" (R. 448 and the very leading R-X. Q. 179 of plaintiffs' counsel).

This is not the type of proof required to overcome the burden of proof resting on plaintiffs. The witness testified (R. 431, Q. 32) that the apparatus as a whole "gravity system" was developed by the F. O. Engstrum Company, being partially developed on the Majestic Theatre Building, "the boom and pipes and this vertical movement to the side and extended over quite a vast area in a crude way" (the witness means horizontal movement). He went on to say that while "that particular angle was developed on the Majestic Theatre job" it was "perfected on the Elks Hall, Christian Science Church and Union League Building." It is significant that other parts of the tstimony established that these buildings were built by Emtman, while Callahan was elsewhere.

On cross-examination by plaintiffs' counsel, the witness was immediately asked about Lee Callahan and his developments, *thereby making Bryson plaintiffs' witness as to this Callahan development work,* which fact was called attention to by defendants' counsel, as shown on page 430. The witness accepted the opportunity to make a very favorable showing for Callahan, stating that he first met Callahan about the middle of December, 1907, and talked with him regarding the distribution of wet concrete and that he had some ideas about distributing concrete, "said it was in the mix" (R. 433, X-Q. 53) and that he could use the tower and skip in conjunction with a chute and pipe, and that he said "the pipe would b e held up by trestles, or swing from the boom." (The first mention of the word boom.) It is significant, however, that the witness also reported Callahan as explaining "a half dozen different ways as far as holding the pipe in the air was concerned," which

agrees with our contention that the boom, if any, was an incidental feature. He also stated (R. 434, X-Q. 59):

> "Callahan developed a kind of a crude pan effect where he had kind of a nail in the center of it where it would revolve around and on that he hung some 4-inch pipe and the pipe was supported by wire from the tower. A day or so after that he put an arm to help to hold up the pipe which revolved around with the pipe when you went to swing it from right to left."

This "crude pan effect" statement, if true, only emphasizes our contention that Callahan, among others in the same company, was not aware of all the highly developed apparatus available for this purpose, which doubtless caused him and his associates to conceive that they had made more of an advance in the art than they really had. For example, Callahan's employees could have *purchased* a swivel joint with a pipe extension, such as was being used in the grain elevator art, by merely ordering one by number after reading a catalogue of some company supplying this equipment, for example, the Webster Manufacturing Company of Chicago, whose catalogue was published in 1901. (See Defendant's Exhibit 12.) This same thing was done by Fargo and Hunt in 1906, in distributing concrete for the Webber Dam, except that the apparatus was made locally, to correspond to an illustration in a grain dealer's equipment catalogue, instead of being ordered from the manufacturer.

Callahan's employers (or rather Emtman) also got into difficulty immediately by using 4-inch pipes, which were entirely too small, a difficulty which was avoided from the outset on the Webber Dam in 1906 by using 11-inch pipes, illustrating the simplicity of the solution, when trained engineers had the problem in hand.

With reference to the subsequent success of this ap-

paratus on the Majestic Theatre Building and the details of the support of the pipe by a wire, or possibly by a brace or boom, such facts were brought out almost entirely through leading questions by plaintiffs' counsel, as shown on page 436. If any boom was used on this apparatus, and we maintain that such use is not proved, it was nothing more than a short brace or stick to help prop up some part of the pipe, the real boom, as such, being developed later on other buildings no earlier than the fall of 1908 and after the date of the St. Louis Coliseum erection. "However, though, you know that a boom was a stick that afterwards developed into a boom 20 or 25 feet long." (See R. 437, X-Q. 93). If the later boom was 20 or 25 feet long, the earlier Majestic Theatre "stick" could not have been much more than a prop or brace of moderate length, certainly much less than 20 feet.

The witness further testified that Callahan was not continuously with the Engstrum Company on the Majestic Theatre job, but left after six or seven months and was put on a San Diego job, the Timkin Building. This was the apparatus apparently from which the Callahan patent drawing was made. We shall discuss it later.

The witness brought out that Callahan was in the employ of the Engstrum Company for eight or ten years, which would be until 1916 or 1918, and that both the Callahan and Emtman apparatus was used on the various buildings constructed during the years subsequent to their development. The witness stated that Emtman's apparatus was used on about two-thirds of the buildings and Callahan's on about one-third, "after both systems were perfected."

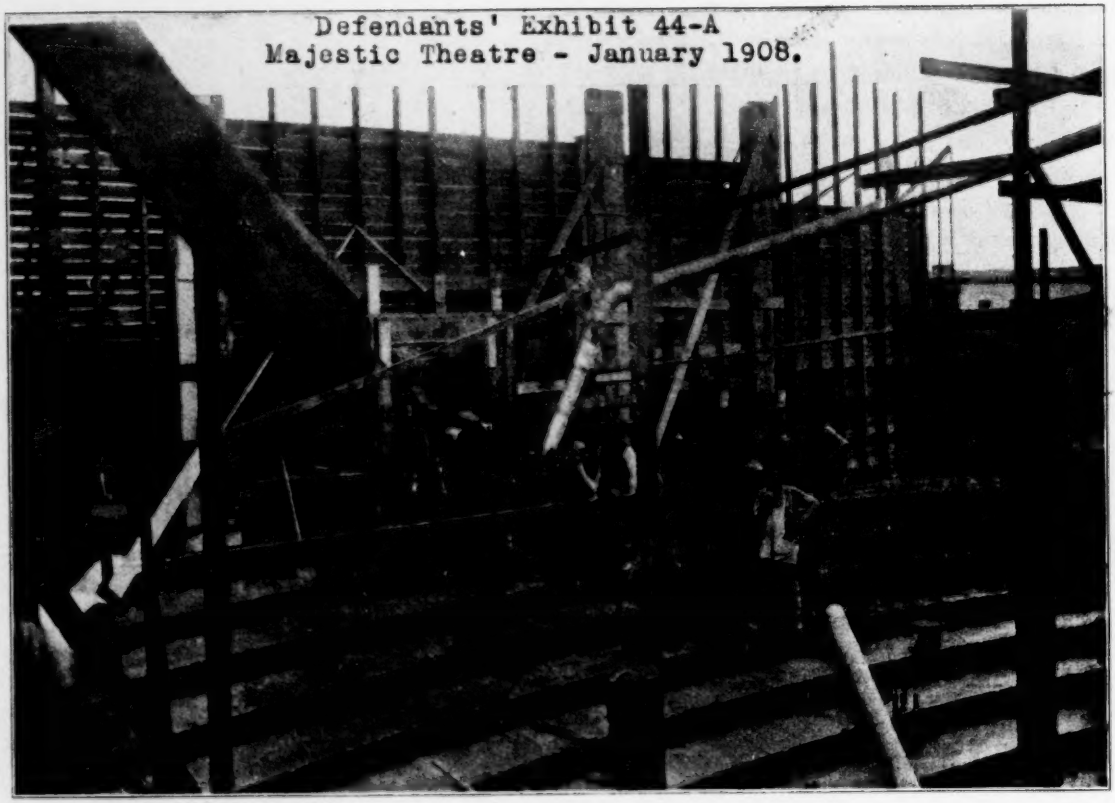
"Emtman's patent was applied for through Lyon & Hackly, patent attorneys, Los Angeles," said Mr. Bry-

son, "and I paid the necessary attorneys' fees at the time." This shows that Emtman and Bryson were in close contact with reference to this development work and considered it a company matter, Emtman assigning his application to the company shortly before it was filed. (See Exhibit 68.) Callahan, on the other hand, employed Mr. Sheehy in Washington, D. C., beginning correspondence with him late in 1908, and apparently without the knowledge of the company. In fact, the Patent Office record and much of this record is persuasive that the company had no knowledge that Callahan claimed to be the alleged inventor of this Majestic Theater Building apparatus, or anything of the same character, until the interference was declared in the summer of 1909, and even then his claim was based on the Timken Building. This situation confirms our contention that the officers of the company regarded Emtman as the first inventor of this general character of apparatus, whether with or without a boom, and were doubtless surprised to learn much later that Callahan made claim to it, although it is now to their interest to assert the contrary.

Bryson also said that Callahan never had any financial interest in the Concrete Appliances Company (R. 444, R-D. Q. 150). In other words, he was a mere employee. He was, therefore, bought out when it was discovered that he had filed an application for a patent, and since Emtman was a stockholder of the company and the company was to own both patents, it would be immaterial, from the company's standpoint, which was the first inventor of the boom combination; also since *Callahan filed his application a few weeks earlier than Emtman*, it is not difficult to see why *Emtman was asked to concede priority to Callahan of the boom claims* in order to avoid a useless contest in the Patent Office.

Furthermore, Callahan may have had some pride in being recognized as the prior inventor in selling his application to the company, and perhaps obtained a better price for it, whereas to Emtman it would be immaterial whether he was considered the prior inventor or not, since he would profit in either case through his stock interest in the company. *Having previously assigned his application, he had nothing to gain.* It is also quite likely that, upon consultation with the company's patent attorney, Mr. Lyon, and a discussion of the actual evidence, it developed very clearly that Callahan's boom apparatus used in the fall of 1908 was earlier than Emtman's boom apparatus developed on the Elks Building, and other buildings begun somewhat later than the Timken Building, and upon a close scrutiny of the issues by the attorney it may have developed that Emtman, while relying on the Majestic Theater apparatus in his preliminary statements as establishing the general concept, as in the three party interference, may have considerably overstated the case in relying on it as a reduction to practice of the boom apparatus in the two party interference. Since the testimony seems to bear out the fact that no boom was used on this Majestic Theater Building, but was probably used by Emtman about a year later on the Elks Building, and others of the same period, the company's attorney would naturally recommend a concession of priority in accordance with the actual facts, to avoid obtaining an invalid patent. In other words, we believe it is a fair inference that the concession in the two party interference from Emtman to Callahan was *an admission that Callahan's Timken Building apparatus was earlier than Emtman's Elks Building apparatus,* and that neither party was entitled to rely on the Majestic Theater Building apparatus; otherwise their dates would have

Defendants' Exhibit 44-A
Majestic Theatre - January 1908.



been identical and neither would have been prior, to say nothing of the impossibility of proving the use of a boom on this building.

We call attention to the fact that *no one has been able to produce, on behalf of plaintiffs' any photographs showing a boom used on this Majestic Building;* nor has anyone offered in evidence any drawings showing such boom, aside from a crude sketch made by Callahan the day he testified, the boom in which is different from that described by any other witness. There has been some conflicting oral testimony and considerable discussion by witnesses called both by plaintiffs and defendants, to the effect that some kind of a prop or stick was used. However, such oral testimony, unsupported by photographs or some documentary evidence, is utterly lacking in all the essential requirements (*Barbed Wire Case,* 143 U. S. 275). Defendants, on the other hand, have offered in evidence, as Exhibit 44, four photographs from the files of the architect, L. A. Parker, although produced by Mr. Bryson. These pictures were taken some time after the apparatus in question was first put into use, and show pipes supported in a hap-hazard manner on scaffolding or false-work, but *no sign of a boom.* Plaintiffs have endeavored to show that the alleged prop or boom was used in constructing the balcony of the Majestic Theater. If so, it would have appeared in some of these four photographs, as they were, obviously, taken at that period, as they show the balcony both before and after the pouring of the concrete.

Our contention is that this Majestic Theater apparatus was a crude early apparatus, involving pipes which were too small initially, and none too large finally; that they were *supported on falsework and moved about by hand,* and that no boom, in the ordinary sense of the word, was successfully used at this time; that such apparatus as was

used was *suggested by Emtman,* Callahan possibly doing some of the detailed work; that both parties seeing the necessity for improvement, developed the apparatus at a *later date* by improving it in numerous respects and doing the very natural thing of *adding a boom* to swing the larger pipes, to avoid the inconvenience of having them lifted around by the workmen, a method that was apparently practical on the Majestic Theater Building, where small pipes were used.

Emtman was naturally the man to suggest and install this Majestic Theater apparatus. Bryson stated (R. 442, X-Q. 133):

> "Mr. Emtman was in charge directly of it. He was a man we used as a general utility man, a man we consulted frequently on mechanical operations and our plan was to keep him as free as we could from any one particular job; except where necessary to put him on a job we were organized to such an extent that we could call him off that job if needed. Mr. Callahan might be termed a sub-foreman on the job; he had other foremen over him."

The fact that Callahan may have had some ideas for distributing concrete through pipes before reaching Los Angeles at the end of 1907 does not change the situation, as anyone who read the technical magazines of the earlier period would have had similar ideas. Emtman may have had the idea of a boom in mind during the use of the pipes on the Majestic Theater Building, and quite likely would think of it as a logical addition to the equipment, to be applied on some later job where heavier and larger pipes would justify it. This view is confirmed by his preliminary statement, in which he sets up a date corresponding *exactly* to the beginning of the use of this Majestic Theater apparatus, whereas Callahan apparently had no such thought in mind until after he had left the Majestic Theater job and gone to San Diego, as he gave no date

corresponding to the early use of this apparatus, but instead gives dates corresponding exactly with the work on the Timken Building, about ten months later.

By way of reminder it should be stated that both Callahan and Emtman filed two preliminary statements. The accompanying chart gives all of this data in condensed form.

Smith, Emtman and Callahan were in what may be called the first interference, and Emtman and Callahan in the second interference, these interferences being concurrent however. The dates alleged by Callahan in his first interference were exactly the same as in the second, and the dates alleged by Emtman were likewise identical in the two interferences. The issues in the first or broader interference, which were conceded to Smith by Callahan and Emtman, involved the following four elements—see claim 3 of the Smith patent, which was count 2 of the interference:

> "a concrete elevator, a revolubly mounted distributing pipe adapted to be fed by said elevator, a second distributing pipe revolubly mounted at the mouth of the first-named distributing pipe, and means for controlling the angle at which said distributing pipes are mounted."

The *means* for controlling the angle is obviously *any* support for the pipes, *i. e.*, horses, falsework, block and tackle, or a boom, whereby the pipes may deposit the concrete at any point in a given area and the slope may be changed, if desired.

It will be noted that this claim reads on the Majestic Theater apparatus, and Emtman, therefore, as the inventor thereof, was justified in basing his statement thereon, in the three-party interference. However, in the two-party interference he was not justified in relying on this same January, 1908, date, as his attorney, Mr. Lyon,

doubtless recognized when he permitted a concession of priority from Emtman to Callahan on the claims involving a *boom,* such as claim 1 of the Callahan patent, for example, which was in the two-party interference and comprises the following elements:

> "a tower, a suitably supported horizontally movable boom connected therewith, a conduit carried by the boom, means for raising plastic material to a suitable point in the height of the tower, and means for receiving plastic material from said raising means and conducting the same to said conduit" (*i. e.,* a hopper).

In the above interferences Callahan had the same opportunity to rely on the Majestic Theater apparatus in his preliminary statement as did Emtman, but he was honest enough, at the time, to stick to the facts and not attempt to appropriate some one else's work as his own, even though the claims in the three-party interference *read directly* on the Majestic Theater apparatus, being very broad with reference to the type of support for the conduits or pipes. By selecting a date of October, 1908 (the Timken Building), he *admitted,* in substance, that he was not entitled to the Majestic Theater date as to the broad issue. Much less was he entitled to the narrower issue, including a horizontally-movable boom connected to the tower.

We also called Mr. Parker as a witness. He stated that he took progress photographs of the Majestic Theater Building, up to the eighth floor, in addition to those which we offered in evidence, but that they showed nothing of interest. If any of them had shown a boom, it is obvious that plaintiffs would have produced such photographs, either through Mr. Parker or through his partner, Mayberry, who made an affidavit, which plaintiffs filed in support of their preliminary injunction motion in the fall of 1920, alleging the use of something which supported the

Interferences Nos. 30,533 (Three-Party) and 30,618 (Two-Party) Arranged in the Order of Filing in the Patent Office.

Callahan.	Emtman.	Smith.
	Conception.....June, 1906	
		Conception.....July, 1906
		Sketches.....July, 1906
		Drawings.....July, 1906
		Disclosure.....July, 1906
		Reduced to practice.....Aug. 1906
		(Amended).....Sept. 1906
	Sketches.....Oct. 1906	
	Disclosure .....Dec. 1906	
Conception..July 15, 1907		Further use..... 1907
Sketches.....July 15, 1907		
Model .....July 15, 1907		
Disclosure ..Aug. 15, 1907		
	Reduced to practice Dec. 1907 or Jan. 1908	
Description....Sept. 1908		
Reduced to practice.....Oct. 11, 1908		
		Further use..... 1908
Working drawings.....Nov. 5, 1908		
Filed .....Jan. 21, 1909		
	Filed .....Feb. 17, 1909	
		Filed.....Feb. 23, 1909
Commercial use	Made seven other devices	Commercial use

Callahan and Emtman conceded priority to Smith of the broad issue in the three-party interference—a combination of four elements.

Emtman conceded priority to Callahan of the narrower issue in the two-party interference involving the issue in suit—a combination of five elements.

conduit "in the manner of a boom," and further alleging that the apparatus was described in a magazine, the Engineering Record of January 30, 1909, pages 128 to 130.

We note that *this magazine was not offered in evidence.* Obviously, the article did not disclose the boom. We again emphasize the fact that *the burden of proof is on the plaintiffs to show the use of a boom in the erection of this building,* and specifically, prior to the date of the earliest Coliseum apparatus photographs of August 27, 1908.

On cross-examination Parker testified (R. 451, X-Q. 201) that the pipe was supported at one end "by block and tackle and rope" and "wire, that they tie forms with"; also that he could not "remember that particular point," but that he knew the "general method by which it was supported." He naturally would be as familiar with it as anyone, as he had "complete charge," in association with Mr. Mayberry, as engieeer on the building for the architect, and later as superintendent for the Realty Company, Parker having charge of the outside work and Mayberry of the office work. Parker also described further supports consisting of cross-pieces nailed across posts and "it might have been on a brace down to the concrete." It had a swinging extension at the end of the pipe. This description was given *in his own words,* and makes *no mention of a boom.* As the cross-examination progressed, however, plaintiffs' counsel asked him a series of leading questions, suggesting a pan-like affair and the use of a brace. He also suggested the word "boom." These various suggestions were acquiesced in by the witness—see his testimony (R. 451-453, inclusive, X-Qs. 203-225). With reference to the brace, the witness said he could not state "absolutely, positively, that it was used right then at this particular time, although I know

specifically, though, there was a similar device that the pipe was carried on." This might have been, however, toward the end of the year 1908, as the construction of a building of this character usually requires about a year's time. There is nothing definite or postive that this brace or boom was prior to the Coliseum date of August 27, 1908. Furthermore, the description of this boom as a "brace" is in conflict with the testimony of Mr. Engstrum, president of the plaintiff company, given in open court, to the effect that the boom was like the one in the court room before him, *i. e.,* an open lattice boom (R. 588):

> "Q. 10. Please describe the apparatus.
> "A. The apparatus is nearly similar to this model here with the exception that it was all built of wood, with iron connections, and (fol. 51) the boom was used in a slightly different manner, but the pipe was used suspended under the boom."

(R. 592):

> "X-Q. 51. Was this boom you refer to sort of a prop that helped prop up the pipe?
> "A. No. It was a boom latticed with wood, similar to this boom." (Witness refers to the model before him.)

The witness also stated (R. 454, X-Q. 230) that the fact that the photograph, Exhibit 44-D, showed no swinging pipe or guy line, justifies the inference that such apparatus was used. We do not understand this ready conclusion. He may have meant that the photograph does not necessarily justify the inference that such apparatus was not used. Certainly there is nothing in the photograph to show that such apparatus *was* used, particularly if the question related to a boom, which is doubtful.

The witness fixed the date of construction of this apparatus, after consulting certain records, as either the last week in 1907 or the first week in 1908. He also con-

firmed the fact that Emtman was general superintendent of the job, whereas Callahan was "one of the straw bosses." Plaintiffs' attorney suggested to him that possibly Lee Callahan had "quite a bit to do" with this chuting apparatus, but the witness replied, "Well, as far as quite a lot to do, I don't remember that." (R. 454, X-Q. 227.) The witness recalled instructions regarding the building of the apparatus as coming from the Engstrum Company, but not as coming from any particular individual.

While Parker is our witness, and testified (though rather vaguely) as to the use of a prop or boom on this Majestic Theater Building, it should be remembered that such testimony was largely in response to very leading questions by plaintiffs' attorney, that the witness lived in Los Angeles and had doubtless seen the development of the gravity system from its inception, and might easily be confused as to just how early the boom was used. Furthermore, he himself took the photographs which are in evidence, and had the boom been such an important feature as plaintiffs now believe it to be, he would undoubtedly have taken photographs of it. The witness' business affiliations naturally allied him with plaintiffs' side of the case rather than with defendants' side. Even under these conditions the witness was *not able to state definitely and positively what kind of a boom* was used, *when* it was used; nor was he asked by plaintiffs' attorney to make a *sketch* of it, nor could he produce a *photograph* of it. Furthermore, it seems reasonable to infer that such apparatus as was used was more likely to be a development of Emtman's suggestions, or others in the Engstrum organization, than Callahan's, an outsider.

Defendants also called Theodore Emtman as a witness regarding this Majestic Theater Building, but, as previously stated, his memory was utterly deficient in all matters which might in any way have damaged plaintiffs' case. Mr. Bryson was in the room during the taking of the testimony of this witness, as well as of the witness Parker and others, which may have made it more difficult for the witnesses to remember too much detail about Emtman's development work. Even a casual reading of Emtman's testimony shows his extreme bias and his reluctance to confirm even his own prior sworn statements. It is enough for our purpose to quote page 610 as follows:

> "Q. 39. I have here a paper purporting to be a record. I will ask you to look at it and refresh your recollection by it, and after you have done so, please state if you were involved in an interference with Callahan.
>
> "(Objection omitted.)
>
> "A. It has nothing that refreshes my memory unless it has got my signature to it.
>
> "By Mr. Barton: The paper here referred to, being a certified copy from the United States Patent Office, is offered in evidence and marked Defendants' Exhibit 58, Certified Copy Emtman Preliminary Statement.
>
> "(Objection omitted.)
>
> "Q. 40. I ask you to read Defendants' Exhibit Emtman's Preliminary Statement, which I now show you, and after reading it, state whether you recall any of the facts stated therein.
>
> "(Objection omitted.)
>
> "A. I do not remember any of it. If the records are there, of course it's there.
>
> "Q. 41. You have read this preliminary statement carefully, have you?
>
> "A. Yes.
>
> "Q. 42. Do you believe this preliminary statement was made by you?
>
> "(Objection omitted.)
>
> "A. I do not remember.

"Q. 43. The question is as to whether you now believe you made such preliminary statement, not as to whether you remember.

"(Objection omitted.)

"A. I do not remember."

Despite this lack of memory the witness recalled readily that apparatus such as Callahan's was used on the Majestic Theater Building (Qs. 55, 56). However, when asked to describe it he mentioned a tower, hoist, bucket, hopper and pipe, but *no boom*. Evidently he was willing to help his company to the extent of forgetting everything that would be damaging, but he would not go to the length of describing apparatus which he knew was not in fact used at the time in question.

The witness was also shown a copy of his deposition in the Canadian suit, and looked it over, but was "unfortunate enough not to remember anything about what is in this copy." The copy itself is Defendants' Exhibit 60 (R. 514).

Another witness called by defendants was K. O. Wetzel, who was employed by the Engstrum Company in 1908. His testimony, in brief, is to the effect that Emtman had charge of the concrete work on different buildings from 1906 to 1910; that he was at the Majestic Theater Building during its construction; and that he identified photograph Exhibit 44-D; also that he knew Lee Callahan, and that Callahan had a talk with him in a general way of an invention that was involved in some litigation in Canada (presumably several years later).

Mr. Bryson was also in the room during this testimony, which may account for the fact that the witness' testimony was not as full and complete as we had been led to expect from a preliminary conference.

The next witness was Luther M. Hill, of Los Angeles, general manager for Charles A. Fellows, contractor—a man who had had twenty-six years' experience on construction work. He stated that his company during a certain four-year period constructed one hundred and forty-nine buildings in and around Los Angeles (R. 519), and that during the last fourteen years he had been in active charge of more than $1,000,000 worth of work per year, and during the last five years of probably $2,000,000 worth of construction per year (R. 519). He also testified that he lived within a few blocks of the Majestic Theater Building, passed the building night and morning on his way to and from work, and was particularly interested in the system used to distribute concrete, as it was new to him and seemed to have merit. He described this system (R. 519, Q. 9) in some detail, including a pipe extending from the hopper, which pipe was "supported by a scaffolding and tripods, and was accessible from the scaffolding in order that men might shake it, or otherwise start the concrete to flowing after it had choked up and filled the pipe." He stated that he did not remember having seen a boom used in connection with this apparatus (Q. 11) and that (Q. 13)—

> "It was at times possible to see the spout and everything above it, from the time concrete was emptied into the spout, until its discharging end disappeared into wall forms of the building. I believe I would have seen a boom, had there been one."

He also explained (R. 521 and 522) how his company had purchased spouting equipment from the Insley Manufacturing Company for the erection of a building for the Santa Fe Railway Company. This apparatus consisted of spouting suspended from a cable with tackle, with its lower end on a tripod, the lower extension being arranged to swing horizontally. It was taken down,

however, for the reason that it had been determined that "we could place concrete much more economically without the apparatus than with it. Theoretically, it looked practicable, but, in reality, it proved to be very burdensome and expensive."

After the apparatus was taken down Mr. Lee Callahan was sent to remedy the difficulties, and constructed and mounted a long lattice boom on the tower, which boom afterwards collapsed, nearly causing serious injuries to employees. It was stated that this apparatus was "wholly impracticable" and it was taken down, after which they themselves made some sheet iron spouting and a 40-ft. boom and used it, although it was not more economical than depositing the concrete in wheelbarrows. Furthermore, the Insley apparatus was never paid for, nor were they asked to pay for it. The witness also stated that he employs a gravity system wherever conditions make it economical, and that *neither he nor Mr. Fellows pay royalties* on such apparatus.

Another witness was Swan Johnson, formerly employed by the Engstrum Company, who visited the Majestic Theater Building during its construction and saw trestles for supporting the pipes. He testified that he ran across Mr. Engstrum at the building, and that "he was mad, because he said the boys were using too much lumber building towers and trestles for running concrete there" (R. 526, Q. 18). This excess of trestles does not imply a boom, but quite the contrary.

Howard C. Blake, of Chicago, now in charge of the construction department of Morris & Company, the packers, testified that he was on the Pacific Coast from 1906 until the outbreak of the war investigating building conditions there for an Eastern concern, and that he was frequently

in Los Angeles. He made a casual visit to the Majestic Theater Building about February or March, 1908, but saw nothing of any particular interest in connection with the apparatus there used, although he did not go above the lowermost floor. This was the time, however, when plaintiffs allege the boom was being used. The witness also visited the Timkin Building during the summer of the same year, evidently before Callahan had constructed his apparatus, as he recalls nothing unusual in connection with that building either. The witness testified that prior to 1912 he did not hear of or see in use the apparatus which plaintiffs contend was developed in California prior to that date, although it was his business to keep in touch with developments in building construction and knew Mr. Engstrum, Sr., and had a few talks with him.

The witness pointed out the effect of the earthquake and fire on building construction in California and elsewhere, with particular reference to the increased use of reinforced concrete thereafter.

Plaintiffs called Lee Callahan as a witness to testify regarding the development of the invention of the patent in suit. He testified as to an early interview with Mr. Bryson prior to Christmas, 1907, and to a disclosure to him of 4-inch pipes placed on a boom pole to be attached to a tower (R. 68, Q. 5). He states that he had this apparatus ready about the first of January, 1908, and after overcoming difficulty due to the use of too small a pipe, he used the apparatus successfully throughout the remainder of the building construction. The bucket was arranged outside the tower and the hopper inside. The witness said he had made some earlier sketches, which were not preserved, and therefore he made a memory sketch, Plaintiffs' Exhibit A, intended to illustrate this Majestic Theater apparatus. This is the only sketch or

showing of any kind other than the oral testimony of the witness regarding this apparatus. Instead of showing an *upwardly inclined* prop for the pipe, such as suggested by some of the other witnesses, the sketch shows the pipe suspended by a block and tackle and reinforced by a wooden member *on* which it apparently rests, this member being what Callahan calls the boom pole.

A comparison of this sketch with the Smith sketch of the Lynnhaven Hotel apparatus, Defendants' Exhibit 20, as used in the fall of 1906 will show a marked similarity. The first section of chute in each case is supported by block and tackle, the chief difference being that Smith's chute or trough was made of wood whereas Callahan shows a small pipe stiffened or reinforced by a wooden member beneath it and in contact with it.

Contrast this showing of a pipe *on top of* a wooden supporting member with the testimony of Mr. Engstrum, the president of the company, previously quoted, that the pipe was suspended *under* a latticed frame or the so-called boom.

The witness also produced a drawing, Exhibit B, corresponding in general to the apparatus used on the Timken Building and said to have been finished in the month of August, 1908 (however there is no corroboration for this testimony of the witness). A stamped date, December 17, 1908, on the drawing was said to have been on the drawing when it was returned by the patent attorney in Washington. The witness says he showed this drawing to Bryson. Callahan also testified that he took charge of the Timken Building about August 18, 1908, and used from the foundation up, the apparatus of Exhibit B. He also produced a photograph, Exhibit C, showing the apparatus, the photograph according to stipulation having been taken about March, 1909 (R. 74.) This being the only definite date Callahan has established

aside from his patent applicatiou, **we contend that he is limited in his date of disclosure, and reduction to practice to the filing date of his patent, that is, January 21, 1909,** as there is no corroboration for the dates given for the two earlier drawings, and for the tracing dated November 20, 1908, Exhibit D.

Despite this repetition of our contention made before the District and Circuit Courts, petitioners have the temerity to assert on page 37 of their brief that we "admit the existence of the Callahan apparatus in the Timken Building in San Diego in the summer of 1908, as shown by Petitioners' Exhibit C." We have made no such admission.

Callahan testified in answer to the question when he first conceived the apparatus, described very specifically in Q. 60, that he first conceived it in 1901. His preliminary statement, sworn to August 9, 1909, however, gives the date of conception of the same apparatus as July 15, 1907. He also testified, Q. 61, that he had no conversation with anyone regarding this apparatus until his disclosure to Mr. Bryson shortly prior to Christmas, 1907, while in the preliminary statement he swore that he "First explained the invention to others on about August 15, 1907." As he did not reach Los Angeles until about November 18, 1907, this earlier date indicates, not a mistake as to time but a disclosure to some other party in some other city, which party was not called as a witness to corroborate this affidavit. He also testified regarding a certain prior use of wooden chutes in a crude way in 1901, 1903, 1904 and 1905.

The witness on cross-examination recalled the interference with Emtman and Smith but felt that Smith had copied his apparatus and had previously visited his work. This, of course, was impossible, as Smith had the St. Louis Coliseum apparatus in operation in 1908, several

months earlier than any date Callahan has been able to establish for his Timken Building apparatus and Smith in 1906 was using apparatus in Norfolk, Va., very similar to the sketch, Exhibit A, said to have been used by Callahan in the earlier part of 1908. Callahan admitted in substance that the apparatus of his patent and of Smith's patent were substantially the same, that is, the differences were minor structural features. Having *conceded priority* to Smith of certain broad claims not involving the detail of a boom for supporting the chute, as distinguished from any support whatsoever, Callahan's patent involves little, if anything, over the Smith patent which represents an earlier apparatus, the St. Louis Coliseum.

With reference to Callahan's testimony regarding his apparatus on the Majestic Theater Building, we note that although he claims to be responsible for said apparatus and his assignees now regard it as an important date of invention, *he did not regard it as of sufficient importance to take photographs of it,* saying (R. 82, X-Q. 88), "I had no occasion to take them and did not care anything about them," whereas, on the Timken Building (R. 85, X-Q. 110) he had photographs taken of the building "from the beginning of the work clean through the work," although Exhibit C (taken in March, 1909) is the only one he has left. This picture was taken to show Callahan with his arm pointing directing the work. It and the others were evidently taken because Callahan felt that he had done something original, of which he wished to keep a record. If he had been responsible for the Majestic Theater apparatus in any way other than as a workman carrying out instructions given him by his superior, it seems reasonable to suppose that he would have had sufficient interest to take photographs of that apparatus also, or to

have obtained copies of the photographs taken by the company, or by Parker, and to have retained them.

The witness testified that he *did not know* Mr. Emtman at the time of the Majestic Theater Building work, had never heard of him, and only knew him casually at the present time. Evidently Callahan's work on that building must have been of a very minor character or he would have come in contact with the general superintendent. Callahan admitted (R. 82, X-Q. 94) applying for a position, "whatever the opening might be," and starting as a "journeyman" and afterwards being "what you might call a straw boss, supervising the carpenters for the form work." It seems inconceivable that he should have invented the apparatus used on that building without even knowing the superintendent who was a stockholder in the company, and in very close touch with the other members of the Engstrum organization, all of whom were much interested in the apparatus as first used in January, 1908.

This situation confirms our contention that Callahan was in no way whatever responsible for this Majestic Theater apparatus, but having seen it operate and gained some experience on this work, coupled, perhaps, with his prior knowledge that concrete could be made to flow through wooden chutes—a knowledge that he shared in common with many others—he developed his first apparatus in the fall of 1908, his idea apparently being to provide an apparatus which would swing through a wide angle and reach as much of the floor area as possible to overcome the inconvenience of locating the pipes on the temporary falsework, as was done on the Majestic Theater Building.

The witness states he told Mr. Bryson a short time before he went to San Diego, that he was going to apply for a patent on his apparatus (R. 84, X-Q. 105) but

there is no confirmation for this statement and he testified later that when the interference was declared he sent the necessary information to his attorney "without consulting Mr. Bryson or anyone else" (R. 88, X-Qs. 131 and 160, 161). The witness confirmed Mr. Bryson's testimony as to the purchase of his patent by the company for "proper compensation" (R. 87, X-Q. 127).

The witness was also shown a copy of his 1914 deposition in the Canadian suit and identified it in substance. He also identified, in a general way, the Vancouver apparatus of Insley involved in the suit, Defendants' Exhibit 45. In discussing this apparatus he admitted that booms had been used for many years (R. 90, X-Q. 142). "There is not much difference whether you operate with a cable or a boom" (R. 91, X-Qs. 146-149). The witness attention was to the fact that in the Canadian testimony he stated that he first used his completed apparatus on the Timken Building, San Diego, and he confirmed this testimony in substance. When asked if he would now wish to modify these answers in this earlier deposition, he gave a long confused answer (R. 98, X-Q. 178), from which we are unable to draw any conclusion. However, on redirect examination his attorney suggested to him that he probably misunderstood X-Q. 31 of his Canadian deposition (R. 96) and was thinking of his U. S. application instead of his Canadian application, thereby advancing the date in question about a year, to which the witness agreed. However, X-Q. 31 referred to is perfectly clear and the testimony given at that time (shortly before the St. Louis depositions were taken), when there was no particular advantage in establishing an earlier date, is much more convincing than the present testimony in which a few extra months would be exceedingly valuable to plaintiffs. His attorney also asked him what apparatus he had in mind

in his preliminary statement alleging reduction to practice October, 1908, and he immediately took advantage of the opportunity to point out that his apparatus was "perfected on the Majestic Theater," which would give him a date of January, 1908, instead of October, 1908 R. 100, R-D. Q. 184). None of this testimony, however, is particularly convincing in view of the extreme necessity plaintiffs were under of carrying their date back from October to January to avoid the St. Louis Coliseum defense. The witness' last answer is of considerable interest (R. 104, R-X Q. 197), in which he says:

> "I have used a similar little pole, boom pole, to stiffen or to carry for sections of my work, for instance, the Majestic Theatre Building. This boom pole, or a like pole, can and has been used as any other boom pole that would be built, that you may call my attention to, in the lattice construction, like I used on the Timken Building. I also showed what I call a yard arm or round pole used there on the Timken Building, in the photograph which I have presented in evidence here."

Plaintiffs can hardly support a claim for a broad pioneer patent on any such statement as this.

C. W. Ellis, of New York, managing engineer of the Concrete Appliances Company from the spring of 1910 to the fall of 1912, was called by defendants as a surrebuttal witness, the end of November, 1921.

By way of explanation it should be said, that at the open court trial in October, 1921, F. E. Engstrum, the president of Concrete Appliances Company, testified that the Majestic Theater Building apparatus had a boom, similar to the model produced by plaintiffs in court (but not in evidence); also that Lee Callahan "was the designer and originator of that apparatus," and that the boom was "latticed with wood" similar to the open lattice work boom of said model (R. 592, X-Q. 51). De-

fendants had previously taken testimony to establish the use of boom supported pipe sections mounted on a tower on a floating barge used in building certain docks in San Francisco by the Healy-Tibbetts Company, the date alleged by Mr. Horton and others connected with the company being 1906 and subsequent years. By way of rebuttal, Engstrum testified in open court that Parrott & Company, their San Francisco agents, prepared the designs for a barge of this character in 1912 for said Healy-Tibbetts Company and that said company paid royalties to the plaintiff company through the Parrott Company, their agent; also that the witness had knowledge of these negotiations leading to the granting of a license to said Healy-Tibbetts Company and that no statement was made by the Healy-Tibbetts Company alleging use of similar apparatus at an earlier date, as Mr. Horton and others connected with said company had previously testified.

Ellis, in his deposition referred to (R. 559) testified that while he was with Concrete Appliances Company he was used as a promoter and salesman in introducing and putting the G. Y. (gravity) system of distributing concrete on the market and that in this system the concrete was handled through pipes and afterwards through open troughs (Q. 4). He said that he was personally responsible for the making and issuance of the catalogue, Defendants' Exhibit 59, containing photographs of various buildings in that vicinity by the plaintiff company, that the Concrete Appliances Company was practically a subsidiary of the F. O. Engstrum Company, in which Mr. Emtman was a general foreman; that he knew Mr. Bryson, as well as Mr. Engstrum, Sr. and his son; that Mr. Bryson held a position in both companies and had the final say with regard to the policy in all matters; that Mr. Bryson was interested in all patent debates, but

left most of these matters to their patent attorneys and to the witness.

Ellis also testified that while with the company, he was instructed and always had his eyes open, when he was traveling around the country, for anything that might show prior use of their gravity system of distributing concrete (Q. 17) and (Q. 11) that the officers of the company "were always interested to know what the attitude of the other contractors was toward the Concrete Appliances Company." The witness states (Q. 18) that he "ran across two claims of priority, one by Healy-Tibbetts Company of San Francisco, and the Great Lakes Engineering Company of Chicago." (He probably meant the Great Lakes Dredge & Dock Company of Chicago.)

Upon being asked to explain this Healy-Tibbetts matter more fully, he stated that he ran into it on one of his visits to San Francisco when he was soliciting business for Concrete Appliances Company; that the engineer of the Healy-Tibbetts Company at that time informed him "that they had been using this method of distributing concrete in the construction of docks on some government work prior to the San Francisco fire or earthquake, and used it very extensively after the earthquake on the rebuilding or repairing of docks which were destroyed"; also that he told the witness where he could find a barge, which was then tied up at a dock; that witness "looked this apparatus over and found that it embodied the general features of the G. Y. system, the barge having a tower of about 30 feet, and concrete hoist, hopper, and about 20 feet of pipe, which was so attached that it could be swiveled from the discharge end of the hopper, together with other apparatus which was not assembled." The witness states that he took photographs of the apparatus at the time and wrote the company about it. This was the spring or summer of 1911 (Q. 42); also that he

discussed this prior use with Mr. Bryson and Mr. Emtman, but they did not see at that time that it had a direct bearing on building construction, although the witness believes Mr. Bryson recognized that the structural features of this apparatus were similar to their gravity system, ignoring the possible differences in application as between marine work and building construction.

Witness testified that all licenses issued by Concrete Appliances Company under the patents covering their gravity system, were issued after his connection with said company (the spring of 1910) and that the record of all sales and inquiries were sent to him personally for correction and approval. He also testified that while he was with Concrete Appliances Company, the latter did *not sell* any gravity system to the Healy-Tibbetts Company, *nor did they license* said company to use their apparatus, and that he would have known of such sales had they been made. He knew, of course, the Parrott Company, of San Francisco, were agents of Concrete Appliances Company, but stated that The Parrott Company could not have furnished the Healy-Tibbetts Company with drawings and specifications of such apparatus without violation of their agency contract, and the inference from his testimony is that he would undoubtedly have known if any deal had been made.

The witness testified that he was a graduate of the University of Michigan, in mechanical and electrical engineering, and had extended experience in the designing of engineering apparatus used in construction work. The witness was handed a copy of the Callahan and Emtman patents owned by Concrete Appliances Company and asked if either of the structures therein were used or sold by said company or the Engstrum Company. He replied that fundamentally they covered the apparatus, but not in detail. He also stated that ignoring the details of

construction, the Emtman patent was the one which illustrated the construction utilized by the company while he was with them and that the structure shown in the Callahan patent was not used during said period, which, it will be noted, was later than the date of the Timken Building begun in the summer of 1908 and finished probably during the latter part of 1909. The witness testified that

> "We experienced all the troubles which a new industry goes through in the process of evolution, such, for instance, as the falling down of towers, breaking of booms, congestion and uselessness of pipes, and the eventual success of the open trough" (R. 563),

which latter was adopted during his association with the company. In other words, *the apparatus was not on a satisfactory basis* until at least as late as the spring of 1910, when witness' employment with the company began. The witness explained more fully that the open trough was adopted while he was in Chicago consulting with Witherspoon-Englar Company, due to the failure of apparatus which they were operating on the closed pipes, and that he received a wire from Los Angeles that Mr. Snooks, a foreman, had overcome this congestion by converting his pipes into troughs.

Healy-Tibbetts Company's Apparatus, San Francisco.

Defendants took deppositions in San Francisco in May, 1921, to prove the use of concrete distributing apparatus on a barge used in building docks in San Francisco. The apparatus was said to comprise a tower, a hoist, a hopper, and pipes extending therefrom and supported by a boom, this apparatus, according to the witnesses, having been in use at the time of the earthquake and fire in 1906, and used for several years subsequently.

The first witness, Charles C. Horton, testified (R. 527) that he was vice-president of the Healy-Tibbetts Construction Company and had been with them since 1892. Briefly stated, he described the barge apparatus in great detail, and testified at considerable length regarding its use on Piers 42 and 44 in San Francisco in 1906, and subsequently on other piers, including 36 and 38.

The witness stated that the barge had been dismantled for the last eight or ten years, but that he had inspected what was left of it lying in the water that day. A drawing of the apparatus, as it was said to have been used in 1906, was prepared during the testimony and was discussed by the witness—see Exhibit 61. The witness was cross-examined as to all the foregoing testimony.

Another witness was Martin E. Brown, superintendent of construction for said company, who had been with them twenty years or more (R., 534). He stated that he was in immediate charge of the work in question, and also described the apparatus at considerable length. He stated that the drawing referred to was prepared under the direction of Mr. Horton and himself. He described the apparatus in great detail, and was also carefully cross-examined with respect to it. The witness produced a rusty, conical hopper, which he said he showed to plaintiffs' attorney a few days before, and which he had taken from the water and brought into the office. It was said to be a part of the original apparatus—the upper end of the pipe section which was attached to the hopper (R., 548, Q. 96). It was offered in evidence as Exhibit 62.

Another witness was Fred L. Ayre, 53 years old, who had worked off and on for the Healy-Tibbetts Company for twenty-five years (R. 624). He also identified the barge apparatus and thought it was used on Pier 42. At

any rate it was before the fire. The witness identified Exhibit 62 as a piece of pipe, the same or similar to the one used in all the work. He was also cross-examined quite fully (R. 582).

In open court, in October, 1921, plaintiffs called F. J. Ginsberg (R. 582), who testified, in substance that he was employed by the Healy-Tibbetts Company shortly after he reached San Francisco, August 27, 1906, giving the date entirely from memory, and that he saw no such apparatus as the barge apparatus, in use by them. However, his work was on various buildings rather than on dock work. He also testified that the pipes shown in the drawing, Exhibit 61, would not convey the concrete, and that the piece of pipe, Exhibit 62, was evidently part of a trémie, that is, a series of pipe sections hung vertically in order to deposit concrete under water. On cross-examination it developed that he is now connected with the company that sells Insley equipment in New York City.

The president of the Concrete Appliances Company, Mr. Fred E. Engstrum, also testified on behalf of plaintiffs in open court in October, 1921 (R. 588). He stated he was also president of the Newport Ship Building Corporation, Wilmington, North Carolina, and was completing "$7,000,000 of concrete ships," presumably for the government. His testimony regarding the use of an open lattice boom on the Majestic Theater Building, has already been discussed. He testified also that his company's San Francisco agent, Parrott & Company, designed a barge apparatus for the Healy-Tibbetts Company in 1912, and that the latter paid royalties to said Parrott Company for the Concrete Appliances Company, and that he had personal knowledge of these transactions and of the negotiations leading up to the *granting of the license* to the Healy-Tibbetts Company at that time.

He also stated that the Healy-Tibbetts drawing, Exhibit 61, showed a conduit through which concrete could not be poured, unless it were practically vertical, although he admitted that the concrete would flow if the slope was fairly steep (X-Q. 277). Plaintiffs' attorney brought out most of this testimony through a series of very leading questions, causing the court to remark that the "impression you get from the answers to these questions does not help that side" (plaintiffs side). The witness also referred to the fact that Emtman had been a stockholder in his company, and had been associated with Mr. Bryson, Engstrum's brother-in-law, in various business enterprises outside of the Concrete Appliances Company.

This open court testimony of plaintiffs regarding the alleged payment of royalties by Healy-Tibbetts Company in 1912 *was not supported in any way by the production of books* either from the Concrete Appliances Company's files or those of the Parrott Company, to whom their royalties were said to have been paid, although plaintiffs had had several months to prepare for this open court testimony. Nevertheless, defendants felt that it threw a cloud on their San Francisco depositions, and therefore obtained permission to take surrebuttal testimony.

The San Francisco surrebuttal opened with a stipulation regarding the testimony of James Byrne, substantially fixing the dates for the building of Piers 42 and 44 as the spring of 1906. (R. 613.) After this Mr. Horton was called as a witness to confirm the date and the fact that this company was paid $5000 as a bonus in connection with this work, in view of the emergency occasioned by the earthquate and fire. Mr. Horton denied (Q. 14) the payment of any royalty to Concrete Appliances Company or the Parrott Company. When asked regarding

the use of this apparatus of 1906, the witness expressed some doubt. On cross-examination he stated that the apparatus previously described "is subject to mistakes that may arise in a man's memory concerning something that took place fifteen or twenty years ago," and left the impression that he was in doubt as to the pier on which the barge apparatus was used, and that he was "in doubt as to the exact character of the concrete distributing plant that was used on Piers 42 and 44." The witness re-examined the drawing, Exhibit 61, and suggested a few corrections in it. However, in conclusion, he stated that he was "reasonably sure that the barge was used on a part of the concrete work" (the 1906 dock work), but he was not sure that "the boom attachment and other improvements were a part of the equipment at that time." The witness was shown a copy of a recent affidavit of December 1, 1921, confirming his prior testimony, and stated that the affidavit represented his recollection at that date, as well as in the early part of the year, when he gave his first deposition. He made the further statement that this uncertainty had arisen during "the last two or three weeks." (R-D. Qs. 58-60.)

This doubt, which the witness stated had arisen in his mind during the last two or three weeks, naturally raises an inquiry in the minds of defendants as to what could have occurred to cause the witness to recede somewhat from a position of which he was apparently very sure when subjected to a thorough cross-examination in May, 1921, at which time he had had several weeks' notice of the proposed testimony and ample opportunity to refresh his recollection. Also he received an inquiry from defendants' counsel in October, 1921, very shortly after the open court testimony, with reference to said testimony and replied in a letter *confirming* his prior testimony and denying the royalty payments, which letter was made the

basis of the motion for surrebuttal testimony. Following this he *signed the affidavit* of December 1, 1921, copied into the record, again confirming the facts just referred to.

Plaintiffs, at the time the court signed the order for surrebuttal testimony, December 30, 1921, asked and were granted thirty days in which to investigate the situation set up by defendants' affidavits, although they had had since the preceding spring to investigate this entire subject-matter and had an associate counsel in Los Angeles, Mr. Lyon, who attended the San Francisco depositions in May, 1921.

At the end of this thirty-day period Horton was called as a witness and although he had three times alleged the main facts with reference to this 1906 use, twice under oath, he became uncertain as to the use of the apparatus at a very critical date previously relied on.

Defendants have no desire to obtain the benefit of a date concerning which there may be any honest doubt, or to follow the practice of the plaintiffs in the Sixth Circuit and obtain a decision based in any way on a misleading presentation of facts. Nevertheless, the sudden weakening on the part of this witness is significant and is not entirely convincing. He stated (R-D. Q. 49) that since the case has been brought to his attention he has talked to his associates and other men who were engaged in the construction of the piers in question, indicating that the doubt has arisen by virtue of these conferences with others, and as stated in the answer previously quoted, within the last two or three weeks.

If our other prior witnesses were also uncertain, it would appear that there was reasonable doubt as to this early apparatus. However, Fred L. Ayer was again called as a witness and was as certain of his testimony as in the first instance. It will also be recalled that the

witnesses in their original testimony associated the apparatus with the time of the earthquake and fire, a catastrophe so unprecedented that the work on these piers 42 and 44 would naturally stand out above all other construction work on which they had been associated at any time in their lives. Furthermore, Ellis testified that when he saw this apparatus in 1911 he was informed by a representative of the Healy-Tibbetts Construction Company that they had been using it since about the time of the earthquake, and while this is hearsay, it is of some interest as showing even at that early date, the apparatus was associated with this great catastrophe.

Furthermore, the reply testimony taken by plaintiffs in February, 1922, immediately after the surrebuttal testimony of Horton and Ayer, to a certain extent corroborates this surrebuttal testimony in one very important respect, and that is, as to the existence of apparatus of this character at least as early as the early part of 1909 and considerably earlier than the 1912 date sworn to by Engstrum in open court as the time when a license was granted to Healy-Tibbetts Construction Company and royalties paid for the use of apparatus of this character. The testimony of the plaintiffs' witness, which we are about to refer to, therefore *rebuts their own open court testimony* and tends to discredit all their testimony.

Plaintiffs' first reply witness (R. 607) was Robert Tibbetts, 60 years old, formerly with the Healy-Tibbetts Construction Company, of which Mr. Horton is now vice-president, but who left that company in December, 1910 (X-Qs. 26, 27), and started a rival company, known as the Tibbetts Pacific Company, engaged also in constructing concrete wharves and structures of this kind (X-Q. 35). The fact that Mr. Tibbetts is now in a rival business and having a name which might be confused with his early company, in view of the name Tibbetts in both company

names, suggests that Tibbetts may be hostile to defendants. This conclusion is confirmed by the remarks hereinafter quoted with respect to two of defendants' witnesses.

Tibbetts testified in substance, that he supervised the construction of Piers 42 and 44 and that all of the concrete was deposited from cars or buggies, there being no floating apparatus at all used in connection with these piers. He also testified that barge distributing apparatus was used in the construction of Pier 38 and produced three photographs, Plaintiffs' Exhibits O, P and Q, dated, respectively, May 25, 1909, February 24, 1910, and April 8, 1910. The apparatus shown in these photographs comprises a barge with a tower, hoist, hopper and pipe hung herefrom, loosely by chains; that it could be swung about through a limited angle, two of the photographs showing the pipe held out from the tower in an inclined position by a prop or brace tied to the tower and able to swing through a limited angle after the manner of a boom. In fact Exhibit Q shows it pulled a little to one side by a man holding a rope attached to it. This apparatus, of course, does not correspond in detail to the apparatus of the sketch, Defendants' Exhibit 61, but does show the essential elements of the combination in suit, that is, the five elements—tower, hopper, hoist, boom and conduit. The witness testified that this apparatus was the first one ever built by the Healy-Tibbetts Company, and was built at the start of the contract on Pier 38, which was not sixty days prior to the date on the panorama photograph, Exhibit O, May 5, 1909, in other words, it was not built earlier than the end of March, 1909.

Plaintiffs' other witness, Mr. Kebby (R. 597), hereinafter referred to, states that it was built about January or February, 1909. The January date would be earlier than Callahan's filing date. In any case, this apparatus

evidences an invention independent of Callahan and was at a sufficiently early date to antedate the alleged license testified to by Engstrum by three years, and confirms Ellis' testimony in part, at least. The use of this apparatus early in 1909 by no means negatives the existence of earlier apparatus by the same company in 1906, particularly as Tibbetts is the only witness who states that this was the first apparatus used, whereas Martin and Ayer allege quite positively an earlier 1906 apparatus, and Horton seemed quite sure of it until the last two or three weeks before his surrebuttal testimony.

The witness Tibbetts stated that he was acquainted with defendants' prior witnesses, Horton, Ayer and Brown, stating that "Ayer was just a common workman," and that all three of them "are only boys that were carrying tools and were keeping time for me, that had nothing to do with the work, no more than an office boy here." This refers to Piers 42 and 44 in 1906. Upon counsel's inquiry as to whether the witness did or did not see them in connection with the work on Piers 42 and 44, Tibbetts answered:

> "Well, I don't know how to answer such a question. They were both in my employ and I must have seen them, but I never discussed what I was doing, because they were *merely children* to me."

This contemptuous reference to the witnesses suggests a very hostile attitude, and taken together with the fact that Tibbetts now heads a rival company, might well suggest caution in accepting his statements at their full face value, particularly on those vital points, as to which he is the only witness.

Fred Ayer was 53 years old at the time of his first deposition and would therefore have been 38 years old at the time of the earthquake, and has worked for the Healy-Tibbetts Construction Company off and on for twenty-five years.

Horton, who at the time of his 1921 deposition was 44 years old, would have been 29 years old at the time of the San Francisco fire, and considering that he is now the vice-president of the company, must have been a competent man at the time, more than a mere child, and certainly competent to recall the history of his company during the subsequent period, although it seems to be agreed that as far as the 1906 work on Piers 42 and 44 were concerned, Horton's work was not so much outside work and "did not come in daily contact with the rig in question while operating," and, therefore, had "only a general knowledge of what took place." (Horton's surrebuttal testimony, R. 616, X-Q. 24.) However, when asked whether Mr. Tibbetts' recollection as to the apparatus used at that time and the time of its first use would be more likely to be correct than his, the witness stated, "Well, I wouldn't say any more correct than mine, no." (X-Q. 29.)

Martin E. Brown, whose age was not given in the first deposition but who had been with the company "20 years or more," and in the year 1905 and up to the time of the earthquake "was superintendent of construction for the Healy-Tibbetts Company," stated that he was "in immediate charge of that work as overseer" (R. 534, Qs. 2-6). Obviously, he was more than "a mere child," as Tibbetts stated in an effort to discredit him.

That this barge apparatus was an independent invention entirely independent of Concrete Appliances Company or Callahan, regardless of whether it was used first in 1906 or 1909, is evidenced by the last six questions and answers in Tibbetts' deposition to the effect that he has never heard of Callahan, Emtman, Bryson, Concrete Appliances Company or Insley.

Plaintiffs' other witness, H. M. Kebby, testified that he was chief inspecting engineer of the State Harbor Com-

mission at the time Pier 38 was built. (R. 598.) He identified the three photographs referred to as having been taken by himself on the dates indicated thereon 1909 and 1910. It is to be noted that the panorama photograph, Exhibit O, shows two barge distributing equipments, each with a tower, hopper and pipe. If this was a new and experimental type of apparatus as Tibbetts would have us believe, it seems unlikely that the Healy-Tibbetts Construction Company would contract for two of them at the very outset.

Photograph A shows Pier 38 apparently in the very early stages of the concrete work. It is likely that if this were a new type of apparatus at that time, the company would have built one such apparatus first and have experimented with it throughout the building of the dock, and then if it proved successful and satisfactory, have built others like it at a later date. Two such barge equipments in the photograph at the very beginning of the work, is strongly persuasive that one or both of them had been used on earlier pier work, and in any case, earlier than Callahan's filing date of January 21, 1909, and in successful use two or three years before Callahan's apparatus had been changed enough to make it successful. In this connection, the earliest actual photograph of Callahan's apparatus, which plaintiffs had been able to offer in evidence, is given a date by stipulation of "about March, 1909." It should be recalled that this Kebby photograph, although plaintiffs' exhibit, is not in evidence to prove plaintiffs' case affirmatively, but is relied on by defendants' in support of their contention of prior use by Healy-Tibbetts Construction Company.

The witness explains that this apparatus could be swung only a short distance. However, there is no limitation in the claims in suit as to the angle through which the conduit is to be swung. Also the boom in these Kebby

photographs is a very crude affair, but notwithstanding, holds the pipe out and in an inclined position, in the same manner that defendants Philadelphia apparatus type 3 involves an inclined prop or support for holding out the chute, but on a flatter incline.

There is nothing in the testimony of witness Kebby to indicate that either of these two barge equipments might not have been used at an earlier period.

The witness was asked regarding his knowledge of pipes for distributing grain and claimed that those he had seen worked on an "entirely different principle" than the apparatus of the photographs. However, as the principle consists merely in elevating the grain or the concrete, as the case may be, to a hopper permitting it to flow from the hopper to an inclined pipe and from the inclined pipe to some other receptacle, the point of delivery being varied by moving the lower end of the pipe, the difference in principle is not apparent nor is it explained by witness. It is also interesting to note in one of these photographs, Plaintiffs' Exhibit Q, the lower section of pipe apparently telescopes over the next higher section, and is held in place by block and tackle, presumably for the purpose of pulling it up and down to increase or decrease the effective length of the pipe as a whole, almost exactly the arrangement of the Ballinger grain spout discussed by numerous witnesses for defendant and shown in the 1898 Ballinger patent elsewhere explained herein. The chief difference between this apparatus and the swivel pipes, booms and hoppers used on grain elevators for the last twenty years, is that the San Francisco apparatus is considerably cruder than the earlier prototype, which must obviously have been in existence in San Francisco at least as early as the time of the earthquake in connection with the very large shipping business centered there.

The Claims in Suit Are Invalid (B) As They Do Not Cover Patentable Combinations But Mere Aggregations of Several Elements.

Each of the five elements of the claims in suit is admittedly old. The record also shows, and we believe it has been conceded, that the standard apparatus used for hoisting and distributing concrete at least as early as 1906 consisted of three of these five elements. The Ransome Concrete Machinery Company, for example, supplied contractors with a tower, hoist and hopper from which the concrete was discharged into wheelbarrows. In some cases a short chute conducted the concrete from the hopper to the wheelbarrows or directly to the forms. Entirely aside from the prior uses of the complete combination refefred to elsewhere in this brief, we maintain that the addition of two elements—a pipe and a boom—to the standard Ransome outfit results in a mere aggregation. Also considering those prior cases where a short chute was previously used with the Ransome equipment, we maintain that the mere addition of a boom results in an aggregation rather than a patentable combination.

In either case, the boom acts exactly as all other booms act. Its functions are not changed in any manner. It merely supports whatever is connected to it and it can be swung from one side to the other, carrying with it the member suspended from it. The chute performs exactly the same function that any chute performs and is not affected by being associated with the tower, hoist and hopper, or with the boom.

Judge Hollister, in the District Court in the Cincinnati suit, said with reference to these identical claims (see pages 43 to 46 of the "Joint Exhibit for Plaintiffs and Defendants"):

"The apparatus have great utility but no novelty, and mere aggregations of elements, each of which is admittedly old. It will be observed that there is no claimed peculiarity or novelty in the form or construction of any element making up the complete structures claimed by plaintiffs to be valid combinations. Each element undertakes and completes its function in the old way and without producing any new results. There might also be added means for mixing the concrete and means for hauling the various constituents of concrete to the mixer."

We agree with this analysis which follows the line of reasoning adopted by the Supreme Court of the United States in a particularly pertinent case relating to the elevation and distribution of grain from a hopper through a spout. The case was *Richards* v. *Chase Elevator Co.*, 158 U. S. 299; *Id.* 159 U. S. 477. In the first of these cases it was said by Mr. Justice Brown:

"The patent in question is for the combination of (1) a fixed or stationary building; (2) two railway tracks, (3) an elevating apparatus; (4) elevator hopper scales, having a fixed or stationary hopper, provided with a valve or slide in its bottom; (5) a discharge spout, arranged for discharging the grain directly from the hopper into a car.

"Unless the combination accomplishes some new result, the mere multiplicity of elements does not make it patentable. So long as each element performs some old and well-known function, the result is not a patentable combination, but an aggregation of elements. Indeed, the multiplicity of elements may go on indefinitely without creating a patentable combination, unless by their collocation a new result be produced. Thus nothing would have been added to the legal aspect of the combination in question by introducing as new elements the car from which the transfer was made; the engine that drew such car; the steam shovel; the engine that operated the shovel and the elevator; as well as the locomotive which drew the loaded car from the building, though these are all indispensable features, since each of

them is an old and well-known device, and performs a well understood duty.

"Not a new function or result is suggested by the combination in question. The cars run into the building on railway tracks, as they have done ever since railways were invented. The building is fixed and stationary, as buildings usually are. It is no novelty that it should contain an elevating device, and that the latter should raise the grain to the hopper scale, and should discharge it either into a bin or a vessel, or into another car. In principle it makes no difference which.

"*In fact, the combination claimed is a pure aggregation, and the decree of the court dismissing the bill is, therefore, affirmed.*"

See also *Reckendorfer* v. *Faber*, 92 U. S. 347; 23 L. Ed. 719, where the court says:

"The mere bringing together of old parts and allowing each to work out its own old effect, without producing some new machine or product, is not invention. It is necessary always to determine whether the conception of a combination of old parts results from the intuition of the inventor as distinguished from the skill of the mechanic. A combination of old elements to be patentable must produce a different force, or effect, or result in the combined force or processes from that given by their separate parts. There must be a new result produced by their union; if not, it is only an aggregation of separate elements."

See also:

Simon Florsheim et. al. v. *Gustav Schilling*, 34 U. S. 64.

County of Fond du Lac v. *Sarah May*, 34 U. S. 395.

Busell Trimmer Company et. al. v. *Frank Stevens et. al.*, 34 U. S. 423.

(C) Combination Claimed Does Not Represent Invention, But a Natural Evolution in the Art.

Prior to the introduction of reinforced concrete most concrete was in large masses, such as foundation work, etc. The practice twenty years ago in most cases was to specify concrete with so little water that it would quake when tamped, being somewhat jelly-like in this respect. Concrete will resist great compression, but very little tension. Steel reinforcing bars began to be used, among other purposes, to enable the concrete to resist tension, where it is used, for example, for floor slabs and girders.

For this purpose a good bond between the steel and concrete was essential. In order to obtain close contact more water was naturally used, resulting in a thinner mixture which would flow around the bars and adhere thereto upon hardening. This development is described by numerous witnesses. Some of the witnesses also ascribe the use of more water to the introduction of batch mixers; and the grain engineers say it was partly due to the use of tighter wooden forms, which would prevent the surplus water from leaking out. In any case the change from dry to wet concrete was coincident with the introduction of reinforced concrete building, the first tall office building of this character being the Ingalls Building, built in Cincinnati in 1902.

The San Francisco fire in April, 1906, was said by some of the witnesses to have done much to call attention to the advantages of reinforced concrete, and therefore to have stimulated the development of this art.

Whatever the reasons may be, the fact is clearly established that wetter concrete, resulting in a thinner mixture which could be readily poured through chutes and pipes, came into vogue during the period from 1900

to 1915. Under these conditions contractors scattered all over the country began to use chutes and pipes more extensively, and of considerable length, whereas formerly only very short steep chutes had been used in foundation work with drier concrete.

This development was nothing but the natural evolution of the art, which no one is entitled to monopolize. In using the pipes or chutes they necessarily had to be supported and moved about to cover the entire area in question, and the various users supported them by the various well-known means available, such as trestles, cables and booms. The use of these supports involves therefore merely the selection of appliances or tools of the art available for a similar use in connection with the distribution of grain, coal, ore, sand and other material, and it involves no invention whatever.

If contractors generally had been seeking some new and improved method of distributing concrete other than by carts and wheelbarrows, if the testimony showed that numerous attempts had been made to find some improved method but in vain and if under these conditions some one genius had taken the grain-distributing apparatus, such as used twenty years ago, comprising an inclined pipe supported by an inclined boom capable of swinging through a half circle, and had re-designed and modified that apparatus to adapt it to convey concrete, on the assumption that it had not been possible to convey concrete through it prior to these changes; if under these conditions the alleged genius had obtained a patent on these particular structural features or details, as a result of which such apparatus for the first time was successfully used in conveying the concrete, and thus solved the problem which had baffled others for years, such patent would be entitled to universal respect and should be sustained.

However, where, as in the present case, there has been no long sought-for solution for a new method of distributing concrete, but where, instead, there has been a natural evolution in the art resulting in wetter concrete capable of flowing through pipes, as contrasted with dry concrete which would not flow through pipes, but which would clog them, and would not flow through chutes unless they were very short and steep; and where the acceptance of the wetter and more plastic concrete was followed immediately, over a period of several years, by the use of chutes and pipes from the Atlantic to the Pacific by contractors largely out of touch with each other's work; and where in some cases the equipment used was taken practically bodily from the grain-distributing art, and the hoppers, swivel connections, pipes and booms were used bodily, with practically no changes whatever, except possibly to make them of a little heavier steel, such almost universal adoption of the apparatus is strongly persuasive that no invention was involved in such use, but that such use is a natural and inevitable step ahead which was bound to materialize regardless of which of these numerous parties happened to try it first.

The Third Circuit Court of Appeals fully appreciated this situation, as shown by its opinion in which, after referring to the priority contest in which Callahan was involved, it states that these things

> "all serve to show that at or about the same time the natural mechanical evolution of the concrete art and the possibility of the use of wet concrete, mechanically, but instinctively, led all these men to adopt the same general types of mechanical appliances for the chuting of wet concrete."

The opinion also includes the following:

> "Moreover, a study of the proofs satisfy us that from the time concrete came into use there had been a struggle between the architects and designers, who,

as a class, favored the use of dry concrete which would not flow, and the contractors, who, for construction convenience favored wet or mush concrete, which would flow and therefore allow the use of distribution chutes, and that as soon as the use of wet cencrete became general, the art used the wet concrete chutes, which it could not use for the dry."

The claims of the patent in suit are, therefore, clearly invalid for this reason, as they cover what has proved to be a natural evolution in the art.

As stated in the analogous case of *Mallon et. al.* v. *Gregg et. al.*, C. C. A., 8th Cir., 137 Fed. 68, p. 79:

". . . The case is one in which the art was not developed in a single leap by one great genius, but in which many men have contributed both the genius of inventors and the skill of mechanics to its progress, and the advance in it has been gradually made, step by step. . . ."

Also in *Elliott* v. *Youngstown Co.*, 181 Fed. 349, 104, C. C. A., 179, the court remarks:

"The fact that so many persons caught the idea goes rather to prove that it was simple and obvious, and not that it required inventive genius to conceive. It is not like the case where the art is waiting for the device, and inventors striving unsuccessfully to produce it.

"The pertinency of this observation to this case is obvious when we recall the fact that at the same time several men, who lived in widely scattered portions of the country, were in the Patent Office simultaneously claiming this alleged invention.

"These coincidences may be explained by the state of the prior art, which is well exhibited by the record in this case. So great a contrast in defenses exist between the record here, and that before the court at Philadelphia, that some ground is afforded for the suspicion that just enough was made in the latter court to present an adjudication on the apparent merits. . . ."

In *United States Column Co.* v. *Benham Column Co.*, 238 Fed. 200 (C. C. A., Second Circuit, November 14, 1916), the following pertinent statement is made:

> "His opinion sets forth fully and clearly the state of the prior art and his conclusion is rested principally on the presumption of invention arising from the granting of the patents, together with public appreciation of the subject patented. . . . All the elements of the combinations were old and the combination was useful. . . . We are not able to discover invention in extending the cement filling of hollow columns, which was old, into the hollow caps inserted into the casing of the column or in connecting two columns by a rod projecting from the lower into the upper column.
>
> "The decree is reversed."

In the case of *Mallon et. al.* v. *William C. Gregg et. al.*, cited above, the court says, p. 76:

> ". . . various combinations of these mechanical elements to adapt the endless rake to the removal of hay, grain, straw, ice, coal, lumber, and crushed cane, were old and well known before Mallon conceived his invention. What, then, was the novelty of his conception which proves that it was the product, not of mechanical skill, but of inventive genius? Counsel for appellants answer that it was the burst of thought that this endless-chain rake might be used to unload sugar-cane from cars, and the mechanical adaptation of the old devices in which it had served to this new use. Was there, however, an exercise of inventive genius in the conception that an endless chain rake which had been applied to the movement of the materials which have been specified could also be used to rake sugar-cane from a loaded car? The thought that a machine or combination which is discovered in a remote art, where it is used to perform another function, a machine or combination which was not designed by its maker, was never actually used, and was not apparently suitable, to accomplish the desideratum, may be adapted to perform the requisite function, may be, and frequently is, with proper

mechanical adaptation, the result of the exercise of the inventive faculty. But a thought which would naturally occur to any mechanic familiar with the object to be attained, and with an existing machine or combination discovered in the same art or in one nearly analogous to it, designed, suitable, and used to perform a similar function, that this machine or combination can be used or adapted to perform the function desired, is not the product of inventive genius, but the mere result of the application of the skill of the mechanic to the subject under consideration."

Page 78:

". . . The term 'mechanical equivalent' has a broad and generous signification in the interpretation of a pioneer patent, a very narrow and restricted one in the construction of a patent for a slight improvement, and, in the interpretation of patents for the great mass of inventions between these extremes, its meaning is always proportioned to the character of the advance or invention under consideration. *National Hollow Brake-Beam Co.* v. *Interchangeable Brake-Beam Co.,* 106 Fed. 693, 711, 45 C. C. A., 544, 561."

Page 79:

". . . Since at least one element of each of the combinations secured by the claims upon which this suit is founded is wanting in the machines of the defendants, they cannot be held to infringe these claims, and the decree of dismissal is not subject to reversal. The absence from a device that is alleged to infringe a patented combination of a single mechanical element of that combination is fatal to the claim of infringement. . . ."

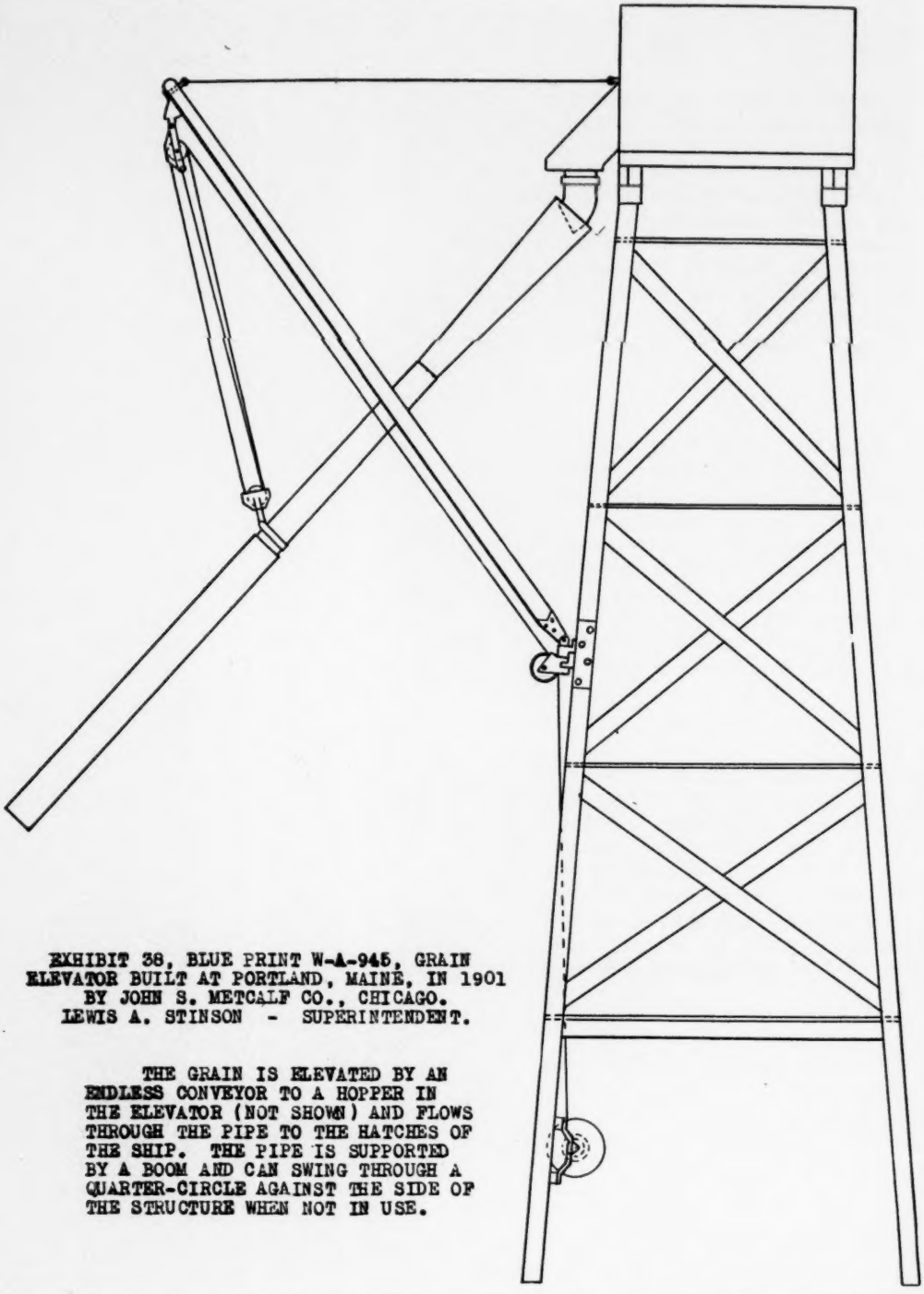


EXHIBIT 38, BLUE PRINT W-A-945, GRAIN ELEVATOR BUILT AT PORTLAND, MAINE, IN 1901 BY JOHN S. METCALF CO., CHICAGO. LEWIS A. STINSON - SUPERINTENDENT.

THE GRAIN IS ELEVATED BY AN ENDLESS CONVEYOR TO A HOPPER IN THE ELEVATOR (NOT SHOWN) AND FLOWS THROUGH THE PIPE TO THE HATCHES OF THE SHIP. THE PIPE IS SUPPORTED BY A BOOM AND CAN SWING THROUGH A QUARTER-CIRCLE AGAINST THE SIDE OF THE STRUCTURE WHEN NOT IN USE.

The Claims in Suit Are Invalid (D); They Represent a Mere Double Use of Apparatus Previously Used For Many Years For Distributing Other Material.

The precise combination of five elements is found in the grain art, having been used for at least twenty years. The Portland, Me., elevator built in 1901 and the New Orleans elevator built in 1905, each comprise—

1. A tall elevator structure or tower.
2. A suitably supported horizontal movable boom connected therewith.
3. A conduit carried by the boom.
4. An endless conveyor for elevating the grain from the ground level to the hoppers near the top of the elevator corresponding to "means for raising plastic material to a suitable point in the height of the tower."
5. Hoppers for receiving the grain from the endless conveyors and conducting it to the conduit or pipe.

See Exhibit 38 inserted opposite page 638 of the record. The second print marked 39 (erroneously) is also part of Exhibit 38.

The use of these five elements and particularly the boom supported pipe for conducting the concrete from a higher point to a lower point and distributing it over the arc of a circle is obviously a mere double use of apparatus previously used for conducting grain to the different hatches of a ship, for a period of at least seven years before Callahan entered the field.

In addition to the Portland and New Orleans elevators in which the booms extended diagonally upward from their swivel support, or seat, we have the standard Bellinger spout used in a very large number of cases on grain elevators in various different cities. The boom used with the Bellinger spout is in horizontal po-

sition and is limited to a side swinging movement. However, the claims in suit imply a side swinging movement but do not specify a swinging of the outer end of the boom in a vertical plane, so that this apparatus corresponds completely with the elements of the claims.

It is true that claim 5 calls for a vertical adjustment of the hopper and of the boom, whereas, the grain elevator apparatus does not require this vertical adjustment. There is a relative vertical movement, however, due to the up-and-down movement of the boat, caused by tides, and also the settlement of the boat as it fills with grain. As elsewhere pointed out, this vertical adjustment, both of hopper and boom, was old in other uses, including the erection of concrete buildings. Claims 1, 2, and 13 do not include this vertical adjustment.

In the absence of proof to the contrary it may be argued that since the Bellinger spout and analogous grain spouts were available for years before Callahan entered the field, and since no one apparently used them just as they were, for the distribution of concrete, there must have been some inherent or subtle difficulty which Callahan overcame, and the overcoming of this difficulty in the adaptation of grain spouts to concrete therefore involved invention. (This assumption of course ignores the use of grain swivels and pipes for depositing concrete in the Webber Dam in 1906). It may also be argued that the mere fact that grain spouts were available for years before Callahan entered the field, and were not universally used for distributing concrete, is very persuasive that the change from the grain art to the concrete art was invention.

The answer to this argument, however, is self-evident in view of the record in the present case. *The reason that grain spouts were not used twenty years ago for distributing concrete was that the concrete of that period*

was too dry to flow through an inclined pipe. The fact that it would clog or choke the pipe was so obvious that it was useless to make the attempt. Comparatively dry concrete was demanded at that time, so that contractors were debarred from adding an objectionable surplus of water to make the concrete flow through pipes. The use of more water in concrete was a gradual evolution, being *opposed vigorously* by the majority fifteen or twenty years ago. During a period of five or ten years there was a gradual change of viewpoint as successful structures were erected with wetter concrete. As soon as concrete wet enough to flow through a pipe became acceptable to architects, builders and their inspectors, contractors in many different parts of the United States began to use pipes or chutes as a substitute for wheelbarrow distribution in cases where the substitution was economical.

It is our contention, therefore, and the records abundantly sustain our contention, that the use of pipes, or, preferably chutes, was a natural and inevitable development from dry concrete to wet and that neither the Concrete Appliances Company, nor any one else, is entitled to a broad monopoly on the most suitable apparatus available at the time for distributing the concrete.

Bellinger, the inventor of the Bellinger spout, and other pioneers in the grain elevator art, were entitled to all the uses to which their boom supported spouts might be put and after their early patents expired the public was entitled to use these spouts, not only for grain, but for any other material which would flow through them.

The Court of Appeals for the Third Circuit, on this question of "double use," said:

> "it will be seen that the steps of lifting grain to get gravity; of storing to get quantity; of chuting to get delivery; and of boom swing and trough

> shift to vary locality of delivery; and also of duplication of these shore appliances by supplemental boom and conduit on shipboard; had all been advanced to a high state of efficiency and delivery point variation in elevator grain practice."

Also:

> "Later, when concrete docks, piers and the like came to be built, it was quite natural for contractors to use in building them the apparatus used for grain chuting and to handle and chute concrete in the same way. And such, the proofs show, was the case as will be seen by reference to but one or two operations."

The gradual discovery by a large number of engineers and contractors throughout the United States that additional water in the concrete would not seriously affect the strength of a building and would have many advantages in making the concrete flow around and adhere to the reinforcing bars, is a discovery to which the public as a whole is entitled. It would be a great injustice *to take from the public* the boom supported spouts which they have been entitled to use for years for any and every purpose and prohibit them at this late date from using them for distributing wet concrete. The alleged monopoly granted by the Patent Office to the Concrete Appliances Company is, therefore, entirely unjust and unwarranted, and deprives the public of something they have been using in the past and which they are entitled to continue to use in the future.

The theory of the patent law is that if an inventor devises some wholly new apparatus which the public *has never used before,* it is no hardship on the public to let the inventor have a monopoly on it for seventeen years in order that the public, at the end of the seventeen years, may have the use of something new which they never had before. It is a *direct perversion* of the patent laws to

take away from the public something they have been using for years and present it to some party who mistakenly thinks he is the first inventor of the apparatus in question, who has succeeded in erroneously persuading the Patent Office of his inventorship, and who by withholding the practical history of the art from the United States courts has succeeded in obtaining a decision from a Court of Appeals affirming his right to an unjust monopoly.

See *Dodge Coal Storage Co.* v. *New York Cent. & H. R. R. Co.*, 150 Fed. 738-740 (Circuit Court of Appeals, Second Circuit, Jan. 7, 1907), previously cited. The court says (p. 739):

> "The patentees say:
>
> " 'The object of our invention is to provide a comparatively cheap structure which will pile material in a *semi-circular or circular* pile from a fixed point, and remove material from the pile to a fixed point.'
>
> "The would-be inventor or designer of novel mechanism for accomplishing these objects, therefore, is presumed to have before him the whole field of the art of engineering construction applicable to the collection and removal, the elevation and conveyance, of such materials from one point to another. And the question here presented is, not what these particular patentees may actually have invented, but whether the state of the art in such engineering field was such that it would require invention to construct such apparatus, or to adapt the constructions known in the art to the exigencies of a particular situation, or the requirements of a certain class of materials."

In *Warner Instrument Co.* v. *Stewart & Clark Mfg. Co.*, 185 Fed. 507 (Circuit Court of Appeals, Seventh Circuit, January 3, 1911), the court states (p. 511):

> "Appellant claims that Cadman's idea was invention because it did not suggest itself for nearly three years to those skilled in the art. In *Warren Web-*

ster & Co. v. *C. A. Dunham Co.*, 181 Fed. 836, where 11 years of experimentation had passed before the patent issued, Judge Sanborn, speaking for the Circuit Court of Appeals for the Eighth Circuit, in disposing of a similar contention said:

"'These arguments are persuasive. They have been carefully considered. But the application of an old device or combination to a new use is not in itself an invention, or capable of protection by a patent. If the relation between the two uses is remote, and the old device or combination produced a new result by virtue of its new application, that application may constitute invention. Where a machine or a combination is discovered in a remote art, where it is used to perform a different function, and where it was not designed and was not apparently suitable to accomplish the thing desired, the application of it with proper mechanical adaptation to a new use is often the result of the exercise of the inventive faculty and may be protected by patent. But the thought that an existing machine or combination discovered in the same art or one nearly analogous to it, designed and suitable to perform a similar function, may be used or adopted to accomplish the desideratum, is not the product of inventive genius, but the result of the application of the skill of the mechanic to the subject under consideration. It is only when the new use is so recondite and remote from that to which the old device and combination has been applied, or for which it was conceived, that its application would not occur to the mind of the ordinary mechanic skilled in the art, seeking to devise means to perform the desired function, with the old machine or combination before him, that its conception may rise to the dignity of invention.'

"We are of the opinion that the Cadman device did not involve invention."

Ransome Concrete Machinery Co. v. *United Concrete Machinery Co.*, 177 Fed. 413 (Circuit Court of Appeals, Second Circuit, March 7, 1910):

"Patents (§ 27*)—Invention—Concrete Mixer.

"The Ransome patent, No. 814,803, for a concrete-

mixing machine, consisting of a batch-mixing drum, in view of the prior Burns patent, No. 661,847, for an apparatus for mixing tea 'and other material,' even conceding that the Burns patent applies only to mixers of dry non-solidifying materials, is void for lack of patentable invention, being a mere adaptation to a double use, requiring only mechanical skill."

. . . . . .

On page 416 the following statement appears:

"The question, then, is whether its use for mixing wet and solidifying materials is for a new and non-analogous purpose. And this resolves itself into the inquiry whether, in case the Burns mixer were used for mixing concrete, it would operate in substantially the same manner to accomplish substantially the same result as when used upon dry material. We think that it would. Notwithstanding the difficulties involved in mixing concrete, we are satisfied that the Burns mixer would act upon the required materials in the same way as upon other materials. The apparatus shown in the Burns patent, with all its appendages, is undoubtedly better adapted to mix a light, dry material than concrete; but we have no doubt that it would mix and discharge the one in the same manner that it would mix and discharge the other, and with quite similar results.

"For these reasons we think the use of the Burns apparatus for the purpose of mixing concrete at the utmost only a double use, not involving invention. It is rather a case of changing the materials to be operated upon than of changing the method of operation. Indeed, it seems about as clear a case of double use as is shown in the well-known illustrations given by the Supreme Court in *Potts* v. *Creager*, 155 U. S. 597, 608, 15 Sup. Ct. 194, 198, 39 L. Ed. 275.

"If, for example, a person were to take a coffee mill and patent it as a mill for grinding spices, the double use would be too manifest for serious argument. So, too, this court has denied invention to one who applied the principles of the ice cream freezer to the preservation of fish. *Brown* v. *Piper*, 91 U. S. 37 (23 L. Ed. 200).

"See, also *Mast* v. *Stover*, 177 U. S. 485, 20 Sup. Ct. 708, 44 L. Ed. 856."

See also the analogous case, *Dunbar et. al.* v. *Eastern Elevating Co. et. al.* (Circuit Court of Appeals, Second Circuit, May 26, 1897, 81 Fed. 201-205, from which the following pertinent statements are taken:

(P. 203):

"Dunbar contemplated making his portable elevator a *high one* capable of emptying its contents into one of the stories of the many-storied grain elevators of Buffalo, but the patent is not limited to such an elevator. The descriptive parts, and some of the claims, though more directly addressed to such an elevator are applicable to one of any height or size. . . .

"It is manifest from what has been said of the prior state of the art that what Dunbar did was to adapt well-known devices to the special purpose to which he contemplated their application. The elevator, with all its equipment for reaching, raising, and transferring grain, was at hand. . . ."

(P. 204):

"We are unable to doubt that all these things were within the range of ordinary mechanical skill, and that they could have been suggested and constructed by any competent builder, and that what Dunbar did was merely to exercise the common skill of the calling . . . The trough which he placed along the front of the warehouse was the receptacle most obviously convenient and in common use in the grain elevators for distributing the grain to different parts of a building. It certainly did not involve inventive skill to place it on the outside of the building, within reach of the spout of the portable elevator.

"We are not unmindful of the advantages which have resulted from the new organization of the elevator described in the patent, but we are unable to doubt that the improvements of Dunbar were but the work of an intelligent builder. When, in the evolution of grain elevator construction, their desirability became manifest, it did not require genius or inventive faculty to create them. . . ."

(P. 205):

> "The circumstance that the same congregation of devices has never been assembled in a new location is not controlling, and is often of little value in determining the question of patentable novelty. Their assemblage may be nothing but another instance of a double use, and, when they require special adaptation to the new arrangement and occasion, it still remains to inquire whether this has required invention. . . .
>
> "We conclude that the patent is void for want of novelty."

See, also, *Roberts* v. *Ryer*, 91 U. S. 150, 157, where the court says:

(P. 151):

> "It is no new invention to use an old machine for a new purpose. The inventor of a machine is entitled to the benefit of all the uses to which it can be put, no matter whether he had conceived the idea of the use or not."

(E) The Callahan Apparatus Was Impractical and Inoperative Until Its Inherent Difficulties Were Overcome by Changes Made by Others.

The difficulties encountered in using the apparatus of the Concrete Appliances Company, whether that of Callahan or Emtman, were brought out by a number of defendants' witnesses.

H. D. Squires, of Chicago, testified (beginning on p. 413) that in 1906 he was treasurer of the William B. Hough Company, middle western agents for the Ransome Concrete Machinery Company. After describing the prevailing method of placing concrete at that time and identifying the Ransome 1906 catalogue, Exhibit 21, he stated that his company also represented Concrete Appliances Company, of Los Angeles, from November, 1910, until the Hough Company went out of business, in 1913.

The arrangement was that the Chicago company was to license others to use the gravity system on a royalty basis. The Hough Company furnished blue-prints and rented to the customer such material as the hoist, hopper, pipes, etc., the customer furnishing the wooden towers and wooden boom.

The first customers were Witherspoon-Englar Company, of Chicago, on a Texas job (the parties who were afterwards sued for infringement in 1916 by the Concrete Appliances Company and Insley), and A. Monstead & Company, of Milwaukee. Both customers had considerable difficulty with the apparatus, a man being sent from Chicago to Milwaukee and another from Los Angeles to Texas. On the latter job there was so much trouble that they refused to use the apparatus on the remainder of the job, and in fact all the material that was rented on the "first two jobs" had to be entirely scrapped (p. 419, Q. 29). The dates of the jobs were December, 1910, and January, 1911, respectively, at which time apparatus of the same general type had been in successful use in St. Louis for some time, as well as in the steel district south of Chicago, and elsewhere, and in other parts of the country.

As the result of these difficulties the Hough Company redesigned the apparatus, after which it operated more satisfactorily. Certain blue-prints and drawings, Exhibit 41, illustrate the apparatus as Concrete Appliances Company proposed to have it used, and Exhibit 42 shows the revised blue-prints. Open troughs were substituted for closed pipes, the swivel pans were made larger and steeper, the strapping on the boom was made more rigid, and other changes were made. While these changes may not seem very radical, they at least amounted to the difference between failure and success, and show that prior to the dates on these revised blue-prints—which bear

various dates in April and May, 1911—the Concrete Appliances Company had not developed its apparatus to a practical workable basis, despite their testimony to the contrary. The witness testified that at the time the agency arrangement was made, in October, 1910, Mr. Engstrum came on from Los Angeles, accompanied by Mr. Emtman, who was represented as the man responsible for the gravity system—see page 417, Qs. 20 and 21, and page 424, Qs. 56-65.

Another witness to the same effect was Fred Bruner, of Pittsburgh who testified in open court (R. 575) that he was the vice-president of the Pihl & Miller Company, of that city, and that in 1910 he was employed by the William B. Hough Company, of Chicago; that his first experience with the Concrete Appliances apparatus was with W. J. Newman Company, of Chicago, in the fall of 1910; that Theodore Emtman, of Los Angeles, was sent on to give the plant a final inspection; that after Mr. Emtman had O. K.'d it, it could not be operated successfully; and that Newman was practically forced by the architect to abandon this method and fill the caissons by the previous cart method. The witness reported Emtman as having claimed to be the one who developed the entire apparatus, and had anticipated getting patents, but had become involved with other people, with whom "it was necessary for him to get together," the patents being assigned to one party.

The next experience was at the Brooklyn Navy Yard, where the witness encountered further difficulties in April or May, 1911 The trouble was the sagging of the chutes, causing them to clog up, and the "entire slowness" of the process.

The apparatus was furnished on a royalty basis of 10 cents a cubic yard, and on the assumption that its use

would save money over prior methods. However, it developed that the cost was at least $10 per yard, a very extravagant figure. As a result the apparatus was taken down and moved.

The sagging of the pipes is illustrated in Exhibit 43, some photographs found by Squires in the files, showing some of the earlier apparatus with the chute propped up to prevent clogging, as described by the witness Bruner in answer to Q. 44 (R. 580).

After the Navy Yard job the witness was with the Parrott Company, of San Francisco, agents for Concrete Appliances Company, and was familiar with the use of their apparatus in Spokane, Washington, in 1912, where it worked out better than it had before. He said this was—

> "the only real job we did on the Pacific Coast. After several attempts to sign up other jobs, which I was not able to do, because all the contractors stated that the lay-out was nice, and it looked good, but they did not feel like paying anyone any royalty for using it. So, therefore, as a general rule, they went ahead and used the apparatus, and our company would get nothing out of it. I wrote to the main office of the Parrott Company and also to the Concrete Appliances Company about these alleged infringements, but never could get any action, so I resigned and came back east" (578 Q. 28).

After the witness came East "practically everybody that had a job where they thought this apparatus would apply were using it," and without the payment of royalties. The witness described several instances in Pittsburgh in 1913.

The fact that apparatus of this general character is now used quite extensively should not be accepted as evidence of merit in the particular equipment devised by Callahan since the more simple and practical modern equipment represents the development of others. The

opinion of the Third Circuit Court of Appeals on the operativeness of Callahan's device is shown by the following:

> "Comparison of Callahan's apparatus with the prior art shows that it really constituted no advance over that art, but on the contrary, rather a step backward. For example, he either had no knowledge of the use of the open trough or chute, or if he had he made no mention of it or suggestion of its possible use, confining his specification and limiting his claims to 'a conduit' of closed pipe. And the proof is that this closed conduit of his claims soon proved worthless on account of clogging and had to be supplanted by the open chute of the earlier art."

The inoperativeness of this early apparatus of the Concrete Appliances Company is also confirmed by the testimony of Ellis and Hill, elsewhere referred to.

The situation is parallel to that in *Trussed Concrete Steel Co.* v. *Goldberg et al.*, 222 Fed. 506-510 (C. C. A., Sixth Circuit, May 4, 1915):

> "No light upon this question of invention is afforded by favorable public reception and use; for the conception of the patent in suit was impractical commercially, as the floor beam, unless made expensively strong, is too weak to sustain (without deflection) the weight of the concrete during construction and thus to dispense with the centering, and the Buente truss seems never to have been used. The patent was purchased by complainant but a few months before beginning this suit.
>
> "In view of the prior art, the claim is, in our opinion, void, unless at least restricted to the form shown in the description of the specifications illustrated by the drawings of the patent. *Duff* v. *Sterling Pump Co.*, 107 U. S. 636, 639, 2 Sup. Ct., 487, 27 L. Ed., 517; *D'Arcy* v. *Staples* (C. C. A. 6), 161 Fed. 733, 738, 88 C. C. A. 606; *D'Arcy* v. *Murray*, 161 Fed. 352, 354, 88 C. C. A. 364. So limited, the defendant's device does not in our opinion infringe the Buente patent."

The foregoing testimony shows that the claims in suit are invalid on the ground that the structure was inoperative and did less to advance the art than others independently developed.

The Claims Are Not Infringed.

In view of the entirely new defenses in this case over and above those before the Court of Appeals in the Sixth Circuit, we have shown that this patent is not the broad pioneer patent which that tribunal was led to believe. The present record shows beyond question that the claims are invalid, or at the utmost very narrow and therefore limited to the precise construction shown. Furthermore, the apparatus alleged to infringe is different.

Even in the absence of any of the prior uses which we have set up, the concession of priority by Callahan to Smith would necessarily limit Callahan's claims to such detailed improvements as he may have made over and above Smith's apparatus.

Defendant's Philadelphia apparatus differs from the narrow interpretation necessarily to be given to the Callahan claims in suit. In the apparatus as used initially, the second type, there is *no boom,* but merely a trussed chute. Even with the third type of apparatus, involving an inclined prop or boom, the claims, if valid at all, must be so narrowly construed that they are not infringed by this apparatus.

Claim 1, for example, calls for "a horizontally movable boom." Callahan's boom, in addition to the usual swing through the arc of a circle, moves *back and forth* across the face of the tower from one corner to the other. To construe this claim as valid, it would necessarily have to be limited to such movement, and defendant's apparatus does not embody this feature. This

same limitation appears in claim 5; in addition, there is a limitation, "Adjustably connected with the tower," which would have to be construed to refer to the very specific arrangement shown in Fig. 3ª, in which the horizontal tracks are adjustably fixed at different points in the height of the tower (see line 39 of the patent).

In addition, claims 1, 2 and 13 call for a "conduit *carried by* the boom," and claim 5 calls for a "horizontally movable boom *carrying* the conduit." This limitation would have to be construed as covering the specific openwork lattice boom marked X in Fig. 1 of the patent drawings, inclosing the pipe L. In other words, the *conduit* is carried by the boom in the sense of being surrounded by it and completely supported by it *throughout its length,* whereas in defendants' apparatus the *trussed chute* is supported at *one end* beneath the hopper and at *the other end* in part by the boom and in part by a diagonal cable running to the top of the tower, there being no intermediate support.

Furthermore, defendants' apparatus does not include the inoperative "conduit" called for by the claims and discarded after several years unsuccessful experimentation by the Concrete Appliances Company in favor of chutes. Defendants used steel chutes, in this respect following the example of the Ferro-Concrete Construction Company on the Ingalls Building in Cincinnati nearly twenty years ago.

Plaintiffs allege in their brief that defendants in their type 2 apparatus have merely *combined* the chute and the boom into a single element, and cite a number of cases to the effect that a mere joinder of two elements into one integral part will not avoid infringement, *provided the integral part accomplishes the same result as the two parts and in substantially the same way.*

Each of the decisions cited contains this proviso as to

accomplishing the same purpose. None of these decisions applies to the present case, for the reason that defendants in omitting the boom have completely omitted its function.

The function of the boom will be clearly understood from a consideration of a number of the cuts in this brief. For example, the first cut, illustrating two types of the combination of the claims in suit; also the cut representing defendants' type 2 apparatus; and the cut of the Smith 1906 apparatus, Exhibit 20. In the last-named cut, where a downwardly inclined chute has its upper end supported by a tower and its lower end supported by a steeply inclined cable, the weight of the chute, obviously, tends to cause it to swing downwardly and assume a steeper slope, this movement being prevented by the inclined cable, which is under considerable *tension*. The tendency referred to results in pushing the upper end of the chute against the tower or its swivel support, the chute being under *compression*. This could be illustrated by a simple stress diagram, which is not thought to be necessary, however, as these forces are well understood by all engineers and are obvious. An open sheet metal chute, or, in fact, a sheet metal pipe or any elongated sheet metal object, will stand very great *tensile* stresses, but comparatively little *compression* stresses; that is to say, if a chute were hung vertically by its upper end, it would be possible to hang very heavy weights on the lower end without tearing it in two. However, if the same chute were placed upright on its lower end and heavy weights were placed on its upper end, the chute would crumple up and collapse.

When a sloping chute supported by an inclined cable, as in the cut, Exhibit 20, or the cut, "Defendants' Apparatus Type 2," is loaded with concrete, the added weight of the concrete greatly increases the compression on the

chute, tending to crumple it up, in addition to the fact that the weight of the concrete tends to make the chute bend or sag in the middle.

In order to resist this compressive stress the chute has to be made stronger than if it were mounted in some other manner. It can be made of heavier metal, or it can be stiffened by flanges, or it can be reinforced by a stiffening frame, including guy wires, as in the case of the Philadelphia apparatus.

The object of using a boom is to *relieve* a chute or pipe of these compressive forces. In the first cut in this brief, where the chutes are hung from booms, it will be seen that each chute or pipe is simply held at its two ends from above, and is therefore under no compression whatever. In fact, each is under slight tension. The booms, of course, are under very great compression, but they are heavy enough to resist it.

The purpose of the boom, therefore, is to relieve the inclined chute completely of compression stresses, and thereby obviate the necessity of making it unusually strong. From this it will be seen that where defendants have chosen to *omit the boom* and use a cable-supported chute with the resulting compression stresses on the chute, they have completely eliminated one of the elements of the claim. They have not substituted some other element, nor have they combined the chute with a boom, for the reason that they have *not relieved the chute of compression;* they have simply stiffened it to enable it to withstand this objectionable compression. Therefore, they have not merely combined two elements into one integral part which effects identically the same purpose, as the stiffened frame does not relieve the chute of any of its compression. They have entirely discarded the boom and its functions in this type 2 apparatus; and under no interpretation can they be said to have

a boom as an element separate and distinct from the chute, as was reluctantly admitted by Insley in open court (R. 126, X-Q. 71).

The court is of course very familiar with the long line of decisions to the effect that the omission of an element of the claim avoids infringement. We call attention to a few of these cases.

In *Eames* v. *Godfrey*, 68 U. S. 78-80, the court states:

> "The law is well settled by repeated adjudications in this court and the Circuit Courts of the United States, that there is no infringement of a patent which claims mechanical powers in combination, unless all the parts have been substantially used. The use of a part less than the whole is no infringement.
>
> . . . . . .
>
> "Eames has a right to use any of the parts in Godfrey's combination, if he did not use the whole; and if he used all the parts but one, and for that substituted another mechanical structure, substantially different in its construction and operation but serving the same purpose, he was not guilty of an infringement."

See, also, *Russell Grader Mfg. Co.* v. *F. B. Zeig Mfg. Co.* (259 F. R. 575-577, C. C. A., Sixth Circuit, June 3, 1919), from which the following pertinent quotations are taken:

> "A self-contained frame and a scraper blade carried thereby are important and undisputed features of plaintiff's patent. Each of the 13 claims contains them. Defendant's machine, as shown by reference to the cut in our former opinion (249 Fed., at page 59, 161 C. C. A. 116), lacks this self-contained frame feature, unless, as plaintiff contends here, the equivalent of that frame is found in the curved, partly D-shaped front-piece (attached to the drawbar), in connection with the scraper blade attached to the rear end of the curved front piece; the scraper blade thus closing the figure D formation."
>
> . . . . . .

"In view of the prior art, defendant's scraper blade is not the equivalent of the rear bar of that frame. The blade cannot be made to do duty at one and the same time as the element carried and as a part of the carrying element. Defendant thus lacks this distinctive element of the claims in suit—the carrying of the scraper blade by the frame of the patent."

"In an overcrowded art, where a broad generic invention is not possible, a defendant who omits altogether one element of a combination cannot be held as an infringer, even though he make another element do the double work. *Underwood Typewriter Co.* v. *Royal Typewriter Co.* (C. C. A., 2), 224 Fed. 477, 479, 140 C. C. A., 163, 164."

See, also, the following cases:

McCaskey Register Co. v. *Mantz,* 224 F. R. 495-496 (C. C. of A., Second Circuit, May 12, 1915).

"We concur with the Court of Appeals of the Third Circuit that the patent is in no sense a pioneer; that there can be no broad range of equivalents. . . . It makes no difference what combination of elements the specifications disclose, these two claims enumerate several separate elements of which one is a 'tab-holder' attached to the bill-clamp and another is an 'index-tab' mounted on the tab holder. To place an indexing letter or number directly on the clamp may be just as good, or better, or worse than putting it on a tab, which may be slipped in or out of a holder, but in the one case there are two elements, in the other only one.

"Since the claim calls for the two elements, it cannot be infringed by a device which employs one only, where there is nothing of a pioneer character in the patentee's device."

Wilson & Willard Mfg. Co. v. *Union Tool Co. et al.,* 249 F. R. 729-731 (C. C. of A., Ninth Circuit, February 11, 1918, Rehearing denied May 13, 1918).

"If the defendant omits one or more of the ma-

terial elements which make up the combination, he no longer uses the combination, and it is no answer to say that the omitted elements are not essential, and that the combination operates as well without as with them. *Leeds & Catlin* v. *Victor Talking Machine Co.*, 213 U. S. 301, 29 Sup. Ct. 495, 53 L. Ed. 805; *Evans et. al.* v. *Hall Printing Press Co.*, 223 Fed. 539, 139 C. C. A. 129. It must also be established by one who alleges infringement of a combination that the entire combination, as a unitary structure and having substantially the same mode of operation, is present in the alleged infringing machine. *Owens* v. *Twin City Separator Co.*, 168 Fed. 259, 93 C. C. A. 561."

Petitioners, in their brief, under the heading, "The Effect of the Interferences," insist that the claims conceded by Callahan to Smith are "exceedingly narrow in that they are specifically limited to a construction in which there is a second chute section which is revolubly connected with the first chute section." We maintain that the second chute section is not a minor detail, but is an *essential part of the combination.* Without it, it is not possible to place concrete at any point within an area bounded by a circle with a radius equal to the combined effective lengths of the first and second chute sections. See R. 423, Q. 49, in which Squires explains this feature in Exhibit 41, Plaintiffs' Drawings of 1910. Bruner also, in open court, explained why this was an important feature (R. 580, Qs. 40-42). The testimony clearly shows and the drawings of the Smith, Callahan and Emtman patents show that regardless of how the first section is supported, it is *always necessary* to have *two sections* so that the second one may be swung around to reach any desired point. If only one section were employed, the concrete would be deposited in a *narrow path along the arc of a circle* and would have to be shoveled by hand or conveyed by carts to the rest of the area. The

Smith claims, therefore, are unquestionably very broad claims in that they cover the combination of the *fewest possible* number of elements which go to make up a successful concrete distributing system, *i. e.:*

1. "Means for elevating the concrete to a point above the plane of the work to be performed."
2. "A hopper adapted to receive the concrete so elevated."
3. "A primary distributing pipe revolubly mounted beneath the hopper."
4. "A secondary distributing pipe revolubly mounted beneath the mouth of the first named distributing pipe."

These four broad elements comprise claim 1 of the Smith patent conceded by Callahan. This claim, if valid, would be infringed by *any one* of the three or four different types of apparatus discussed throughout this suit, as follows:

An apparatus in which the first section of chute is supported by a *boom.*

An apparatus in which the first section of chute is supported by an *inclined cable,* permitting it to swing.

An apparatus in which the first chute section is supported by *a horse* which has to be moved about by hand.

An apparatus in which the first of any number of chute sections are supported from an inclined cable from the tower to a distant point, the so-called "catenary suspension" type.

In other words, the claim is *very broad* as to the particular means for supporting the first chute section. It is broad because it *omits* this unnecessary limitation. It is broad because none of these types could be used without infringing such a claim, since all of them, no *matter how the first chute section is supported,* embody a second chute section, which can be swung or revolved below the lower end of the first chute section.

The Callahan claim, on the other hand, involves *five* elements, one of them being a boom, which is a *specific way* of supporting the first chute section. The claim as a whole is therefore limited, as any apparatus which omitted the boom would not infringe. It is true that the claim also omits the second swivel chute section, but whether it omits it or not, such second section must necessarily be used in order to reach the entire area.

It is obvious that, other things being equal, a claim with four elements is broader than one with five elements.

The Smith claims are made up exclusively of *essential elements* no one of which can be omitted from a completely operative combination. The Callahan claims are *not* made up exclusively of essential elements but include in each case a boom, for which we frequently find contractors substituting cables or horses.

We submit that this is conclusive as to which claims are broadest. In addition, we call attention to page 5 of the appellant's brief before the Sixth Circuit Court of Appeals, in which the present plaintiffs' same attorney stated "Callahan conceded priority to Smith as to certain of the broadest claims."

See the case of *McCaskey Register Co.* v. *Divens* (Circuit Court of Appeals, Third Circuit, March 28, 1912), 194 Fed. 967-969, where the court says:

> "From what has been said, it is obvious that the patent is a very narrow one, and that, if it is sustained, it must be narrowly construed and practically confined to its exact disclosures. . . .
>
> ". . . The claim is broad enough to cover any kind of a yoke, but so many kinds appear in the prior art or in general use that almost any kind was open to adoption. McCaskey chose one form and must abide by his selection. The defendant's device shows a yoke which in structure and location is so different from the complainant's that, under

the circumstances, it cannot be held to infringe it. . . ."

We do not fully understand the conclusions reached in the decision of the Sixth Circuit Court of Appeals, relating to infringement. We understand it to mean in substance that since Callahan filed before Smith and since there is nothing in that record to show that Smith made the invention before Callahan's filing date, Smith could not claim to be the inventor of anything disclosed by Callahan and therefore is limited to such features as he, Smith, discloses over and above what is disclosed by Callahan. The decision then concludes that Smith has a second conduit revolving beneath the mouth of the first conduit section, whereas Callahan has not. However, this seems to be a mistaken conclusion, as Callahan clearly shows the second distributing pipe revolubly mounted beneath the mouth of the first distributing pipe in Fig. 1 of his patent. It is marked B^3 and the lower half is broken away, otherwise it would be somewhat longer. It is also described on page 3 of the patent in lines 5 to 10, inclusive. It is also shown in the photograph of the Timken Building on which this apparatus was first used (Exhibit 59, third from the last page), the photograph showing the concrete flowing from the lower end of this swivel pipe held in the hands of one of the workmen.

The record in the present case is decidedly different and *not* the same as the one in Cincinnati, as our opponents allege, in that we have taken proofs showing that Smith made his invention not only earlier than Callahan's filing date, but earlier than Callahan's invention. Following the reasoning of the said court, we contend that Smith, having been shown to be prior to Callahan, the latter at the most is entitled only to such detailed features as are over and above those disclosed by Smith.

Callahan's claims, would, therefore, have to be very narrowly construed, even in the absence of any other prior developments. Smith used an inclined cable for supporting his first chute section on the Lynnhaven Hotel job, and used an actual boom, shown and described as such in his patent, on the Coliseum job in August, 1908. Plaintiffs admit that the inclined cable is the *equivalent* of a boom in the hope of having their claims interpreted broadly enough to prevent contractors from using even such a simple and well known support. If the Coliseum apparatus had never been erected, Callahan would, at the best, be limited to an ordinary boom as distinguished from the earlier inclined cable of Smith. Since Smith did use a boom on the Coliseum job, however, earlier than Callahan's Timken Building apparatus from which his patent drawing is copied, Callahan under the most favorable interpretation would be limited to practically the very peculiar boom shown in his patent, *i. e.*, a latticed boom supporting the pipe throughout its length and mounted on a little horizontal track at its upper end to enable it to be moved back and forth several feet from one corner of the tower to the other.

In view of the overwhelming extent of the prior art brought out in defendants' record, Callahan is clearly not entitled to have the particular claims in suit narrowed down and given a forced interpretation for the purpose of saving them, when they are obviously invalid, since Callahan has numerous other claims in his patent covering these particular details of a track supported boom, etc. If Callahan is the first inventor of these details, he is protected in his real invention by *these other claims,* but he is not entitled to cover broadly features developed by others prior to the construction of his first apparatus, particularly where Callahan's apparatus apparently proved to be too complicated to suit the Eng-

strum Company and Concrete Appliances Company, as they afterwards departed from it and from the structure of Emtman's patent (as clearly shown in their catalogue Defendants' Exhibit 59, and after several years of development work, adopted and sold through their licensees practically the apparatus of the Great Lakes Dredge & Dock Company, developed at an earlier date.

In this connection we also call attention to the fact that Smith's failure to claim the boom in his patent does not detract from the fact that the boom, as actually used was an anticipation of Callahan. Smith testified that the omission of the boom from the claims was an oversight on the part of his attorney, but in view of the attorney's well known reputation as an authority on patent law, we conclude that the boom was not included in the original claims, as it was such a commonplace feature that the attorney, instead, drew very broad claims with this detail omitted, until such time as the citation of prior patents by the Patent Office would compel the inclusion of this element and other less important features. It so happened that the Patent Office allowed the claims almost immediately, an unusual procedure, and the interference having arisen shortly thereafter and having been settled, there was no opportunity for Smith's attorney to add further detailed claims, including the boom, and Smith's trip to the Philippines at this time necessitated terminating the interference without consulting him.

As to the effect of interferences see:

Elliott & Co. v. *Youngstown Car Mfg. Co.* (C. C. A., Third Circuit, Aug. 30, 1910), 181 Fed. 345-349, where the court says:

"Nor is the ordinary presumption to be indulged in favor of the patent, because of the action of the Patent Office in allowing it; the Urie, Schwarz and Suter

patents, as it appears, not having been referred to, as they have been here.

. . . . . .

"The same also is to be said of the alleged recognition which has been given to the invention by the public, the complainant, as it seems, under the advice of counsel having bought up the patent rather than contested it, and other parties having either taken out licenses, or discontinued infringement upon failure to negotiate for them upon satisfactory terms. These are matters which are no doubt entitled to consideration under ordinary circumstances, but they are of no significance against the showing here. Nor is it necessary to dwell upon the suggestion that applications were made for blue-print machines with an automatic cut-off by four different inventors about the same time, Fullman and Herman among the rest. The fact that so many persons caught the idea goes rather to prove that it was simple and obvious, and not that it required inventive genius to conceive. It is not like the case where the art is waiting for the device, and inventors striving unsuccessfully to produce it, under which circumstances invention may well be held to appear."

Also *Eck* v. *Kutz* (Circuit Court, E. D. Pennsylvania, Sept. 23, 1904), 132 Fed. 758, where it is stated on p. 772:

"But the defendant is met at the outstart by the fact that Burleigh on May 24, 1895, a week after Eck made application for a patent embodying his ideas, and upon an interference being declared between them, into which a third party named Rowe, who was also in the Patent Office with a similar device, was drawn, the proceedings ended in a disclaimer by both Burleigh and Rowe, and the granting to the complainant of the patent in suit. This result does not, it is true, conclude the defendant. He may still show, if he can, that the facts were otherwise; that Burleigh, notwithstanding his declaration to the contrary, was the real inventor; and that the complainant in consequence had no right to that pretense. But he is necessarily at a serious disadvantage in seeking to do so, because he has to maintain that he is better advised in the matter than Burleigh himself

was in entering his disclaimer, and that, notwithstanding the presumption that it was done with full knowledge, it was nothing less than a mistake on his part to make the concession."

Phoenix Knitting Works et al. v. *Rich et al.*, 194 Fed. 722-723 (Circuit Court, N. D. Ohio, E. D., November 27, 1911):

". . . During the progress of the interference, Meyers became in default, and Rosenfeld and Tyrrell (the former abandoning his attorneys and accepting the latter's counsel) yielded to Mead; Rosenfeld conceding priority to Mead and Tyrrell abandoning the subject-matter of the issue.

"At first Rosenfeld was represented by counsel in Detroit. His concession, however, was executed in Milwaukee, the home of the Phoenix Knitting Works, in the presence of counsel for Tyrrell and for Mead. Tyrrell was an officer of the Bradley Knitting Company, and upon the allowance of the patent to Mead under these circumstances, the Bradley Knitting Company became joint owner with the Phoenix Knitting Works, of which corporation Mead was vice-president.

"The facts give the court very little reason to overindulge the presumption that allowance by the Patent Office is a *prima facie* establishment of the novelty of the invention and identity of the inventor. They are too redolent of an amicable adjustment, if not of a juggling, and all the more suggestive in view of the fierce competition in the knitting art over the subject-matter. . . ."

Edward Barr Co. v. *New York & New Haven Automatic Sprinkler Co.* (Circuit Court, S. D. New York, August 18, 1887), 32 Fed. 79-80:

"A presumption of validity arising from a successful interference in the patent-office only applies against the parties to the interference and their privies. It does not extend to litigants who do not make the infringing article under a grant from the interferer."

Western Electric Co. v. *Williams-Abbott Electric Co. et al.* (Circuit Court, N. D. Ohio, E. D., December 2, 1897), 83 Fed. 842:

> "The same rule applies to averments of interference proceedings, for they raise a presumption of the validity of the patent only as against the parties thereto and their privies."

See, also, *McCaslin* v. *Link Belt Machinery Co. et al.*, 139 Fed. 393, where on p. 395, the court says:

> "The interference proceedings, for reasons sufficient to the Court of Appeals for the District of Columbia, terminated in complainant's favor; and his application was found to anticipate Hunt's date of filing, which was September 10, 1892. That decree is not binding upon the defendants, they not having been parties or privies to the proceeding nor claiming under the patent issued to Hunt." Citing cases.

No Public Acquiescence.

Widespread and continued acquiescence by the public is of great assistance to a plaintiff in helping to establish the validity of a patent where the case is otherwise in doubt. The present case is one in which there has been about as little public acquiescence as can possibly be imagined. The numerous suits which the plaintiffs have started (but have not finished) confirm this statement. In addition, we have the testimony of Bruner to the effect that the patent was so generally disregarded on the Pacific Coast that he severed his connection with the plaintiffs' agent, and on returning to the East, about 1913, found the patent quite generally disregarded by any one who wished to use the apparatus. Mr. Hill confirmed this situation on the Coast.

The fact that one of the petitioners, Concrete Appliances Co., has licensed two other companies, in addition

to licensing Mr. Insley, does not establish public acquiescence, but rather suggests the advantage to the licensees of working under broad claims of this patent and the very broad claims of the Smith patent before they were held invalid in the Cincinnati suit. The expense and inconvenience of defending a suit confronts a user or a rival manufacturer immediately upon an inspection of the Callahan records in the Patent Office, wherein it is shown that the development work relied on by petitioners was carried on in California, necessitating making investigations and taking testimony on the extreme western coast, far remote from the larger manufacturing centers of the region east of the Mississippi. In this connection we call attention to *Thropp's Sons' Co.* v. *Seiberling*, 264 U. S. 329; 68 L. Ed. 712 (1924):

> "We are pressed with the argument that many tires, reaching into the millions, have been made under a license granted by Seiberling, and that the success of the device shows the utility and novelty of what he licensed. . . . Both patents made large and sweeping claims which were well calculated to induce acquiescence by those without sufficient knowledge of the prior art, or adequate capital to resist."

The advantage to the two companies referred to, in having licenses under a patent which has been held to be a pioneer patent, is obvious, as three or four companies can attempt to divide between them all the business in the United States at a very great profit to themselves, considering the price of $3,500, which Insley testified he charged for a complete equipment. (R. 119, Q. 10.) About one hundred and fifty such equipments were sold in the vicinity of New York alone within two or three years immediately preceding the trial (R. 119, Q. 9), making a total in excess of half a million dollars.

The Decision of the Court of Appeals for the Third Circuit Should Be Followed, Rather Than That of the Sixth Circuit.

The entirely new defenses, both publications and prior uses comprising the record in the Third Circuit and the fact that a different form of apparatus was used in the two cases, justify this court in adopting the reasoning of the Third Circuit Court of Appeals, rather than that of the Sixth Circuit.

The parties to the present suit filed, as a joint exhibit, a printed copy of the record and briefs in the Cincinnati case, on page 149 of which record is a photograph of the apparatus used by the Cincinnati defendant. Said photograph shows a crane boom or steel skeleton frame hinged to the tower. The conduit is "carried by" the boom in the exact sense that it is supported thereby throughout its length and hence differs fundamentally from the apparatus used by the Philadelphia defendant, as previously explained herein.

With reference to the question of invention, the inventive act is not a fixed and definite thing. What may be invention under one set of circumstances is not invention under another. For example, if a party is the first to use a combination of five elements where no two of them have ever been combined in the same way before, such combination might be invention, as distinguished from mechanical skill. However, if they have all been used before in various groups for somewhat analogous purposes, there may be no invention whatever in first using all five in a particular combination not used before. In the present case, the history of the art has been gone into so fully, as compared to the Cincinnati case, in which the defendant made practically no showing as to the practi-

cal art, that we maintain that an entirely new question is presented on the question of invention as well as on the question of priority of use.

Plaintiffs, in an earlier brief, said that the

> "Court of Appeals of the Sixth Circuit was thoroughly advised of the fact that it had been long common to hoist mush concrete in a tower hoist apparatus to a vertically adjustable hopper situated at successive floor levels, and to chute concrete from a hopper through a series of chutes."

We do not know how the said court could be thoroughly advised as neither side enlightened the court. The record before the Court of Appeals in that case may be searched in vain for any such testimony and plaintiffs' counsel in that case, who is also plaintiffs' counsel in the present case, said on page 4 of his brief before the said Sixth Circuit Court of Appeals:

> "The record shows that the patents in suit are absolutely pioneer in the art. Prior to these patents, no device for the efficient delivery of fresh concrete mixture from the ground level to any desired point in an extended area at a higher level had ever been produced or even suggested."

In view of such statements and of the inability of the defendant in that case to make any substantial showing as to the prior practical art, it is easy to understand why the court was led to render such a sweeping decision holding that Callahan was a pioneer.

In the same brief the present plaintiffs urged that about "90 per cent. of large construction work is now being performed with apparatus of this kind." Although this was the testimony of Insley, it is a gross exaggeration in that it compels the inference that the apparatus referred to involves a boom. The facts are, as brought out in the present case, that a very large proportion of large concrete construction work is now performed with

the aid of tower and chute apparatus, but the chutes are supported in any one of three or four different ways, only a *small percentage* being supported by booms and a very large percentage comprising chutes suspended from cables.

The Plaintiffs Are Not Entitled to Equitable Relief.

Plaintiffs have not come into equity with clean hands. They have attempted to delay and harass the owners of a building in Philadelphia which was being erected in the summer of 1920, at a time when the building shortage was very serious indeed, the building representing an expenditure of over a million dollars. They asked for a preliminary injunction based on a sweeping decision of another Court of Appeals which they knew from the outset was founded on a complete misunderstanding of the history of the art.

The testimony of defendants' St. Louis witnesses shows, and Insley, one of the plaintiffs, admitted in open court that he was familiar with these very important St. Louis defenses, such as the American Theater Building and Coliseum Building, several years prior to the beginning of the Cincinnati suit.

The testimony follows (R. 123-124):

"By the Court:

"X-Q. 46. The question is substantially this: You were a party to the Cincinnati litigation?

"X-Q. 47. And was not that litigation conducted without a disclosure by you of the prior uses which had been made a feature of the Vancouver litigation?

"Mr. Hood: Your Honor, he was the plaintiff in that case. That was not up to him. He was the plaintiff in the Cincinnati case.

"The Court: It is not a question of whether it was

up to him or not. The question is, did he or did he not make a disclosure of it?

"The Witness: No, not to my knowledge.

. . . . . .

"By Mr. Jones:

"X-Q. 51. However, you have advertised rather widely the Cincinnati decision, have you not?

"A. We probably have, yes.

"X-Q. 52. And until we filed our interrogatory in this case asking whether the chutes hung from from an inclined cable, as distinguished from a boom, were an infringement, you were quite willing to have the public believe that even this type was an infringement, were you not?

"Mr. Hood: It seems to me we are encumbering the record with an expression of opinion. It does not make a particle of difference what this witness may have thought his patent covered, or what he may have claimed it covered.

"The Court: That will not do. This is a proceeding in equity, in which he is asking for the extension of the grace of the Chancellor (fol. 220). This line of interrogation is based upon the clean hand doctrine of the Courts of Chancery.

"Mr. Hood: I have no serious objection to it at all. It is all right, if the Court wants to have the information, but it does seem to me that there is more padding of the record than there is any necessity for.

"The Court: I will not restrain counsel. He may develop all the circumstances he thinks proper.

"Mr. Jones: I will try to make it as brief as possible, but there is quite a direct connection, I think, between the two cases.

"By Mr. Jones:

"X-Q. 53. Do you understand the question?

"A. Read the question again.

"(Question No. 52 repeated.)

"A. May I answer that by an explanation, your Honor?

"By the Court:

"X-Q. 54. You had better answer the question, then explain. That is the usual way.

"A. Yes.

"X-Q. 55. You either did or you did not. Answer the question, yes or no; then explain.

"A. My answer is 'Yes' and my explanation is that up to the time of the Cincinnati suit we did have patents which covered substantially the distribution of concrete by gravity through chutes, by any character of chutes, and after the Cincinnati decision the question never came up definitely for a decision as between us and any possible competitor until you brought the question up in relation to this case."

The other plaintiff, Concrete Appliances Company, knew of these defenses also, as it was the plaintiff in the Canadian suit, during the course of which the St. Louis defenses were developed by Insley.

Nevertheless, the plaintiffs have been well satisfied to take advantage of the unfamiliarity of the Cincinnati defendant with these prior uses and, by their silence, misled the Circuit Court of Appeals for the Sixth Circuit, resulting in a decision in which said court stated:

> "On the other hand, it impresses us as a bold and original thought that this material could be handled in this way. Distributing mush concrete through gravity chutes by one apparatus throughout the whole course of building obviously involved difficulties; it had never been handled by gravity chutes at all, excepting under simple conditions where these difficulties did not exist, and then, perhaps, had been done only on paper."

A decision of this character, when read by numerous parties familiar with the article in the Engineering News of July 30, 1903, illustrated by a photograph of the chutes used in building the Ingalls Building in Cincinnati in 1902-1903, for example, or familiar with the erection of the American Theater Building in St. Louis in 1907, would naturally tend to discredit the patent system in their minds, in the absence of some explanation why the court was not fully informed on such well known prior

developments. On the other hand, the reading of this decision by a large number of engineers and contractors elsewhere, perhaps not familiar with developments in Cincinnati and St. Louis, would give them the impression that plaintiffs were pioneers, as a result of which plaintiffs could use this decision as a very effective club in continuing to demand and receive excessively high prices for their apparatus, thereby adding to the already excessively high cost of building operations at a time when the lack of suitable building of every character and description was a national problem.

Other Decisions of Interest.

The United States Supreme Court in *New York Scaffolding Co.* v. *Liebel-Binney Construction Co.*, 254 U. S. 24, said, with reference to a point also in controversy in this case, *i. e.* vertical adjustment of a construction appliance:

> ". . . However, we may concede to counsel, for the sake of the argument, all of the uses and excellences of the patent, even though not discerned by Henderson; but his pretentions, whether at first hand or second,—his or those of his counsel,—must be subjected to the test and estimate of the prior art; and, so subjecting them, **we can discern no exercise of invention. The changes were simply mechanical, easy to discern, and as easy to make**; incidental entirely to the main idea of Murray, which was, as was declared by him, to provide a scaffold that would '*permit of adjustment at any height during the construction of a building* or the repairing thereof,'—a scaffold which might 'be readily moved from one position to another by the workmen thereon without interfering materially with the work being performed;' and one 'in which different supports are employed,' and 'in which the shifting from one set of supports to another set' might 'be accomplished without interfering in any degree with

the workmen thereon, or their work.' " (Emphasis ours.)

See also:

Thomson-Houston Electric Co. v. *Lorain Steel Co.*, 117 Fed. 249 (Circuit Court of Appeals, Second Circuit, May 29, 1902).

Also the following cases, where the patents before the courts related to subject-matter analogous to that of the plaintiffs' patent here, are particularly pertinent:

Dodge Coal Storage Co. v. *New York Central & H. R. R. Co.*, 150 Fed. 738, C. C. A., 2nd Circuit.

United States Column Co. v. *Benham Column Co.*, 225 Fed. 55 (District Court, E. D., New York, June 19, 1915).

Costs.

Our opponents in their brief allege improper taxation of costs by the lower court. They object to the very common practice of the defense of a suit being assumed by the manufacturer of the apparatus used, in this case the Sackett Screen and Chute Company and the Archer Iron Works, both of Chicago. The cases cited in support of their contention, however, are not in point as they relate chiefly to questions whether certain items of cost were actually incurred and also whether such items were in fact proper taxable items. In the present case no question as to the propriety of the items is raised by petitioners, with the exception of one amounting to $210.43, but merely the issue that said items, totaling $1951.66 (exclusive of the $210.43 item), were not incurred by the nominal defendants, individually, as distinguished from the real defendants, the manufacturers. On the other

hand, respondents contend that the court erred in reducing respondents' bill of costs by deducting $210.43, the amount constituting the premium on the bond of the American Surety Company in connection with the preliminary injunction proceedings. The complete items of costs are to be found on pages 653-656 of the record. The exceptions and Judge Dickinson's opinion are on pages 657-658. A stipulation as to the defense of the suit by the manufactures is found on pages 659-660, and the ruling of the Court of Appeals is on page 941.

In cases where the defense of a suit is assumed by the manufacturer of the apparatus in question, the manufacturer is the real defendant and not only may properly assume the defense but should do so in defense of his customers and this practice is so universal as to require no comment.

Petitioners' motion for a preliminary injunction was no less than an imposition, being based, as it was, on a sweeping decision of the Sixth Circuit Court of Appeals, founded on an incomplete presentation of the facts. Defendants (respondents) prepared for the hearing at great expense, and were ready with affidavits covering the important Norfolk, Cincinnati and St. Louis defenses, found in the present record.

When it developed during plaintiffs' argument at the hearing that the preliminary injunction would affect a large building under construction, the court "anticipating and hoping to escape discussion of the questions which it was foreseen would be raised" (R. 658) made the suggestion to plaintiffs brought out on page 658, and defendants had no opportunity to present their defenses, which, as subsequent events proved, would have disposed of any question of an injunction, temporary or final. While the court did not, in so many words, refuse a further hearing on the merits, the furnishing of a bond

was so strongly urged by the court as to amount substantially to a requirement and defendants were practically compelled to acquiesce. Certainly, if the bond had been offered voluntarily by defendants they would not have made all the elaborate preparations for the hearing on the preliminary injunction motion, nor incurred the great expense necessarily involved, where the time initially set was so short. For this reason, the amount of the bond premium, $210.43, included in the sworn statement in the record, on page 656, is believed to be a proper item of costs and is in line with the new ruling of this court in 1924 in:

> *Newton* v. *Consolidated Gas Co.*, 265 U. S. 85; 68 L. Ed. 911:
>
> "In The Texas (C. C. A., 3rd Circuit) 226 Fed. 897, 905, the Circuit Court of Appeals of the Third Circuit, after expressing its approval of the view that a rule of court or a practice equivalent thereto is necessary to justify the taxation of such costs, said:
>
> " 'But we may also say that we think such a rule or practice has become so desirable that we feel confident the court below will take an early opportunity to conform its procedure in this respect to the custom prevailing in other districts.' "

and page 86

> "and where a party litigant has, because of the claim of the opposing party, been compelled to furnish such security, and it turns out that it was wrongly required, a rule of court or usage which imposes the expense of the security on the defeated party is not unreasonable."

The Court of Appeals, in its order modifying the decree, awarded costs to the appellees (respondents) "covering their proper disbursements as users and the proper disbursements of the manufacturers supplying them with the alleged infringing appliances." (R. 941.)

We respectfully submit, therefore, that costs be awarded respondents and the manufacturers, amounting to $2162.09, ($1951.66, plus $210.43), in addition to such costs as may be allowed in this court, if the decision of the Third Circuit Court of Appeals is affirmed, as to the main issues, as we believe it should be.

Conclusion.

The Coliseum apparatus of August, 1908, is a complete anticipation of claims 1, 2 and 13 of the Callahan patent in suit and is a substantial anticipation of claim 5, the only remaining claim. This latter claim reads, element for element, on the Coliseum apparatus and calls for a vertical adjustment of the hopper, as practiced in the Coliseum apparatus, and also of the boom, this latter adjustment being unnecessary in that particular apparatus.

Both of these so-called "adjustments" had been used for years prior to the Coliseum job, and Callahan displayed no inventive genius whatever in removing some bolts, hoisting the seat of the boom to a higher position with a block and tackle, and then bolting it in its new position, at successively higher points, as the building became higher; regardless of whether such successive elevation had ever been necessitated before.

This Colisum use is proved beyond a reasonable doubt, and is not denied by plaintiffs. The burden of proof is therefore shifted to the plaintiffs. The only earlier instance which plaintiffs have attempted to establish to carry back their date of invention is the crude pipe distributing arrangement on the Majestic Theater Building in the first few months of 1908. This apparatus was erected at the suggestion of Emtman and involved no boom other than, possibly, a simple prop or stick, and

even as to this there is very serious doubt. Certainly plaintiffs have failed to prove the use of a boom on this building by even a fair preponderance of the evidence and to the same extent they have failed to prove that any of the apparatus used was the invention of Callahan.

Petitioners do not point out wherein they have overcome the burden of proof, but direct their argument more particularly to the more gradual developments of the Great Lakes Dredge & Docks Company.

Near the close of their brief (top of page 78) they summarize their argument in the following question:

> "Was it invention for Callahan to use the Great Lakes boom, support chute and hopper on a tower and make it vertically adjustably and freely swing thereon?"

The answer to this question is emphatically in the negative.

Callahan was not a pioneer in this field, but made only a small advance in the art, if any, and that advance is covered by the other claims of his patent, which are not in suit. If Callahan devised the apparatus of his patent, as appears to be probable, he is, of course, entitled to protection on those details of construction and he is welcome to said apparatus, as no one else seems to care to use it, not even his own assignee, the Concrete Appliances Co. Callahan's assignee is not entitled to monopolize the broader combination of the claims in suit merely because the Patent Office officials had no knowledge of the practical developments of the art which had taken place at an earlier date, and which had not been patented for the reason, apparently, that none of the contractors who developed them seemed to consider that there was anything patentable in them.

We submit that there has been about as little public ac-

quiescence as can well be imagined, particularly during the early years of this patent and before it became more convenient for contractors to buy this equipment from some licensee concern manufacturing it than to make it themselves. The fact that plaintiffs' licensees may have done considerable business in this particular line in the last few years is not at all persuasive, in this connection, in view of the almost universal lack of prior acquiescence.

It was not until 1911 or 1912 that the Concrete Appliances Company, with the aid of the William B. Hough Company and others, had perfected their apparatus to the point where other contractors, renting it from them, were able to use it successfully and economically, and by that time similar apparatus had been developed independently by others and used extensively in many different parts of the country.

The combination of the Callahan claims in suit involves no invention in any case, but represents a gradual and almost inevitable natural development in the art, which no one should be permitted to monopolize.

The claims are also invalid as they are for mere aggregations, each of the five elements performing its function, one after the other, in a series of steps. Each performed in the same manner that that part had always performed its function before and unaffected by any alleged cooperation of other parts. The boom had *no new* or in fact *any effect* on the concrete flowing through the conduit; the conduit had no effect on the capacity of the hopper to hold the concrete dumped into it and the hopper in *no way effected* the operation of the hoist bucket in its up and down movement. The tower was the same tower doing nothing new. All these five elements operated *exactly* as they had always operated before, either

separately or as used with one, two or more of the other five elements. The elevation of the hopper from time to time in the tower and the raising of the boom to a higher point on the tower did not affect the action of the other parts and each was old, in itself. The various advantages ascribed to petitioners' combination are the *inherent* advantages of such elements when *used in succession;* therefore there is no true *patentable combination* but a *mere* aggregation, and the claims in suit are invalid for this reason also.

The petitioners are not entitled to equitable relief, as their conduct has hardly been of a kind to impress a court of equity. On the contrary, it is the public that is entitled to equitable relief from this alleged monopoly which petitioners have been making the most of for more than fifteen years.

To sustain the claims of the Callahan patent would not aid in promoting the progress of science and the useful arts as contemplated by the Constitution, but would hinder progress and work an injustice on the public, and more particularly on contractors, engineers, and those who invest in buildings.

To sustain these claims would prevent all of these various construction companies whose developments were both concurrent with and earlier than those of the Concrete Appliances Company, from continuing to use the apparatus which they developed independently of each other and independently of any one connected with the plaintiffs. The Wimmer Construction Company, of St. Louis, and all other contractors might be prevented from using their 1908 apparatus on other Coliseum buildings or other structures, even though the Sixth Circuit Court of Appeals has held invalid the Smith patent, which shows this identical apparatus. The Great Lakes

Dredge & Dock Company, of Chicago and New York, might be prevented from continuing to use the apparatus which they began to develop in the spring of 1907. The Ferro-Concrete Construction Co., of Cincinnati, might be prevented from hanging from a boom on a tower, the steel chutes which they have been using in conjunction with a tower, hoist bucket and hopper off and on since 1902. The Brownell Improvement Company, of Chicago, might be prevented from using the apparatus developed by their Mr. Bannister at the time when the railroads changed their specifications from dry to wet concrete. The Selden-Breck Company, the Gilsonite Company, the Gerhard Construction Company, the Pelligreen Construction Company, the James Stewart Company, and other St. Louis companies, might be prevented from using the apparatus developed in St. Louis and St. Joseph, Missouri, in 1907 and 1908, in connection with a boom if conditions happened to justify a boom, and many other contractors and engineers would also be handicapped in using equipment which has been available to them for use since the days of dry concrete. Furthermore, engineers and builders of concrete grain elevators, like Stinson, Sinks and Folwell, would be prevented from permitting wet concrete to slide through the identical boom supported pipes through which they and many others have been distributing grain for at least fifteen or twenty years.

In fact, to sustain these claims would be to take from the public that which it has been using for many years prior to the belated successful development of petitioners' apparatus and that which it is entitled to continue to use indefinitely. The purpose of the patent law is not to deprive the public of something it is entitled to, but to give the public the benefit of something it has not had before.

In view of all of these circumstances we submit that the claims in suit are invalid and the decision of the Court of Appeals for the Third Circuit should be affirmed with costs.

Respectfully submitted,

GEORGE BAYARD JONES,
Counsel for Respondents.

THOMAS F. SHERIDAN,
WILLIAM STEELL JACKSON,
Of Counsel.

CHICAGO, September 30, 1925.

SUPREME COURT OF THE UNITED STATES.

No. 44.—October Term, 1925.

Concrete Appliances Company and William H. Insley, Petitioners, *vs.* John . . Gomery, John C. Schwartz, Michael J. O'Meara, et al.	On a Writ of Certiorari to the United States Circuit Court of Appeals for the Third Circuit.

[November 16, 1925.]

Mr. Justice Stone delivered the opinion of the Court.

In an earlier suit petitioners sought to enjoin an infringement of the Callahan patent No. 948,719, and the Circuit Court of Appeals for the Sixth Circuit held the patent valid. *Concrete Appliance Co.* v. *Me'nken*, 262 Fed. 958. Later the present suit was brought in the District Court for the Eastern District of Pennsylvania to enjoin an infringement of the same patent by the respondents. The District Court expressed the opinion that the claims of the patent did not involve invention, but in deference to the determination in the Sixth Circuit, dismissed the petitioners' bill on the ground of non-infringement. 284 Fed. 518. On appeal, the Circuit Court of Appeals for the Third Circuit held that the patent was invalid for want of invention. 291 Fed. 486. In view of the conflict of decision, the writ of certiorari was granted by this Court (264 U. S. 578) to review the determination in the Third Circuit. *Thomson Co.* v. *Ford Motor Co.*, 265 U. S. 445. Both suits involved claims numbered 1, 2, 5 and 13 of the Callahan Patent for "Material Transferring Apparatus" designed for use in transferring concrete or other plastic materials from a suitable source of supply to working points desired on a building or other structure, in the course of construction.

In principle, the device concerned calls into operation gravity, in conveying mobile substances from an elevated central point to varying working points in building operations. The claims made by the patentee, which relate to a combination embraced in the apparatus described, when paraphrased and separated into their

constitutent elements, comprise: (1) a tower; (2) a boom oscillatory or swinging horizontally, adjustably connected with the tower and adapted to be arranged at various points in its height; (3) a conduit carried by the boom, extending laterally from the tower, connected to it and adjustable vertically at varying heights in the tower; (4) a means for raising plastic material to the height desired in the tower; and (5) a means for receiving the plastic material from the raising means and conducting it to the conduit, both the raising means and the receiving means being adjustable vertically at varying heights in the tower.

The apparatus described in the letters patent is capable of use in conveying "wet" or "mush" concrete from the point where it is prepared for use and distributing it to points where it is incorporated into a building in process of construction. When the mixed concrete is in readiness to be placed in the forms or moulds in which it is allowed to "set" or harden into an integral part of the structure, it is elevated by the "raising means", usually a bucket, skip or other suitable conveyor, to the "receiving means", a hopper, in which the concrete is deposited. From thence it flows by gravity into the conduit and through it to the form or mould, which may be in any part of the structure at a suitable level below the base of the hopper. As the building progresses, the conveyor, the hopper and the attached conduit may be progressively raised within the tower so that gravity may carry the flowing concrete to any desired point at lower levels in the structure.

The several elements in the petitioners' claims which we have enumerated embrace familiar devices long in common use, separately or in smaller groups, both in this and in kindred mechanical arts. It is not argued that there is any novelty in such units or groups and the only serious question presented is whether in combination in the apparatus described, they constitute an invention. That the combination embodied in the described apparatus produces a useful result in the mechanical arts and in modified form is widely used in building operations is established. Our inquiry therefore must be addressed to the question whether the combination is novel and whether it passes the line sometimes tenuous and difficult of ascertainment which separates mechanical skill from invention. The pursuit of this inquiry involves a consideration of the state of the art prior to Callahan's application, of which elaborate proof was made in the trial court.

Because of an evident difference in the state of the proof in the two cases, the adjudications of this patent by the two circuit courts are, we think, only apparently conflicting. It is clear from an examination of the two records, the earlier of which is an exhibit in this suit, as well as from the opinion of the court in the Sixth Circuit, that that court did not have before it the detailed history of the practical development of the art, which was elaborately proved in the present case and which convinced both the District Judge and the Circuit Court of Appeals in the Third Circuit that the plaintiff's appliance did not embody an invention. The question thus presented is one of fact, but notwithstanding the agreement of the two courts below, on this aspect of the case, the difference in result reached by the two circuit courts leads us to review the salient features of the state of the art at about January, 1908, when, according to petitioners, Callahan conceived the combination covered by the claims in his patent. See *Thompson Co.* v. *Ford Motor Co., supra,* 447.

It is a fact of which we may take judicial notice (*King* v. *Gallun,* 109 U. S. 99) that the principle of conveying and distributing a mobile substance by gravity has found exemplification for centuries, in apparatus for lifting water by power, in buckets or other convenient form of conveyor to a central reservoir from which its flow is induced by gravity, through suitable conduits to fixed points or through movable pipes or hose to varying selected points. Long prior to the Callahan application the principle had been applied to other substances capable of flow under the action of gravity, such as grain, coal, crushed stone, sand and iron ore. The proof is abundant that by 1905 it was common practice in the erection and use of grain elevators to provide for raising the grain by endless belt or other conveyor to the top of the elevator; then to discharge it into a receptacle called a garner or hopper from which it flowed by gravity through pipes or spouts having a swivel connection with the hopper and swinging laterally so that the lower end of the spout was movable in the arc of a circle. These spouts were capable of extension, variable at will by attaching additional sections appropriately swivelled, to the end of the section of the spout connecting with the hopper. The conduit or spout was supported, according to need and convenience, by an inclined cable attached at a suitable point above to the elevator tower, or by pivoted boom or gaff attached to the tower

of the elevator and capable of being raised or lowered at its outer end. Apparatus of this type was commonly and successfully used for the unloading and storage of grain and for loading it from storage on to ships or cars in varying positions and distances from the elevator tower; sectional or telescopic spouts attached to the tower and to each other being used to secure the delivery of the grain in the desired direction, and at desired distances, the spout being raised or lowered and given direction by the use of boom and tackle. On occasion there was duplication of the apparatus on board ship by the use of a supplemental hopper and supplemental conduit or chute supported and controlled by boom and tackle located on the ship.

Similar apparatus was in use for the moving of coal by gravity through chutes so constructed as to be moved either vertically or horizontally and supported by cable or boom.

Before 1904-5 it was common practice for architects' specifications to require that concrete used in building operations be mixed "dry", that is, of a consistency which would not admit of its ready flow by gravity. This practice was resisted by engineers and contractors because it was cheaper and easier to use "wet" concrete, which could be conveniently distributed through chutes and conduits. For reasons which need not now be inquired into in detail, the increasing use in earlier years of "wet" concrete in all types of structural work had become the established practice by 1905. Co-temporaneously with this increasing use and, as the proofs show, an active agency in inducing it, was the practical adaptation of the apparatus, used in moving and distributing grain and other substances of similar mobility, to all the requirements for the convenient handling and distribution of concrete by gravity in building operations. Without attempting to refer to all of the numerous instances of that adaptation it will be sufficient to indicate some of the more significant examples which mark its progress.

As early as 1902-3 in the construction of the Ingalls Building in Cincinnati, an apparatus was used for elevating concrete to a hopper from which it was discharged through movable metal chutes supported by horses, to varying required points on the floor area of a building in process of erection. This apparatus was described in The Engineering News of July 30, 1903.

In 1906 a like apparatus was used in the construction of a reinforced concrete building in Norfolk, Virginia. Concrete was ele-

vated in a tower to a hopper which was capable of being elevated from story to story as the work progressed. The chute attached to the mouth of the hopper by swivel was capable of lateral movement and supported by block and tackle attached to the top of the tower.

There is proof of the use at San Francisco harbor in 1904-5-6, in concrete construction, of substantially similar apparatus placed on a scow. It involved the use of a chute moved into different positions by a supporting boom.

In June, 1907, a similar apparatus was used in the construction of a steel framed concrete building in St. Louis, although sketches, prepared at the time, called for a swinging boom for the support of a conduit, the boom was in practice dispensed with, as the steel skeleton of the building afforded a means of supporting the conduit.

In the summer of 1908 an appliance of the same sort was used in the construction of a concrete building at St. Joseph, Mo., the hopper being capable of elevation within the tower as required and the movable chute being supported by cables radiating from the top of the tower.

In 1906 the Great Lakes Dredge & Dock Co. built at Gary, Indiana, a concrete cofferdam using a mixer placed on a car running on a trestle, with a wooden hopper beneath the mouth of the mixer and a movable steel chute extending from the hopper into the cofferdam, the chute being secured by ropes or wires extending to the bracing.

In 1907 in connection with this same construction the apparatus was modified by the addition of a mast to which was attached a swinging boom from which the movable steel chute was suspended. This was in successful operation several months and was constructed by a man who had never seen concrete handled in this manner but who was familiar with grain elevator practice.

In July, 1908, five months prior to the filing of the Callahan application, an apparatus comprising the elements enumerated in the claims in suit was used successfully in constructing a concrete building in St. Louis. The hopper was vertically adjustable, but the boom was mounted at the top of the tower, so that there was no necessity for change of its location vertically as the building progressed. The use of a swinging boom attached to a building in process of erection or to a construction tower, which boom was

in practice raised from time to time as convenience of operation required, was then a well-known device.

In this state of the art, Callahan and several others, in the period 1904-1909, applied for patents on combinations for the conveying of wet concrete through spouts or chutes; their applications resulting in interferences.

Without more extensive examination of the record this state of the proof leads us irresistibly to the conclusion that the combination described in the Callahan application does not constitute an invention.

The observations of common experience in the mechanical arts would lead one to expect that once the feasibility of using "wet" concrete in building operations was established, the mechanical skill of those familiar with engineering and building problems would seek to make use of known methods and appliances for the convenient handling of this new building material.

To say nothing of the universally known methods and appliances for raising and distributing water, there were ready at hand widely used and generally understood appliances for the elevation and distribution of mobile substances, such as grain and coal, which involved, both in principle and in practical detail, all the elements described in the Callahan claims. Failure to make use of these obviously applicable methods and appliances in combination, suitable to the particular work in hand, in dealing with a new plastic material capable of similar treatment would, we think, have evidenced a want of ordinary mechanical skill and of familiarity with construction problems and methods. The adaptation independently made by engineers and builders of these familiar appliances to the movement and distribution of wet cement in building operations and the independent patent applications, within a comparatively short space of time, for devices for that purpose are in themselves persuasive evidence that this use in combination of well known mechanical elements was the product only of ordinary mechanical or engineering skill and not of inventive genius. *Atlantic Works* v. *Brady*, 107 U. S. 192. It is but "the suggestion of that common experience, which arose spontaneously and by a necessity of human reasoning, in the minds of those who had become acquainted with the circumstances with which they had to deal." *Hollister* v. *Benedict Manufacturing Co.*, 113 U. S. 59, 72. This progressive adaptation, much of which preceded and some of

which was co-temporaneous with the Callahan adaptation, of well known devices to new but similar uses "is but the display of the expected skill of the calling, and involves only the exercise of the ordinary faculties of reasoning upon the materials supplied by a special knowledge, and the facility of manipulation which results from its habitual and intelligent practice." *Hollister* v. *Benedict Manufacturing Co., supra,* at page 73. No novel elements were used by Callahan in his device. We are unable to find that their use in combination in it was more than the application to them of mechanical skill in the course of a natural development and expansion of the art. The decree of the court below is

Affirmed.

A true copy.

Test:

Clerk, Supreme Court, U. S.